

MAY 10 2005

OFFICE OF PETITIONS

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21 April 2005

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Patent Office
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Appl.No: 09/242072
Filing date: 14.1.2000
IPC Appl. PCT/AU96/00442
Examiner : Cintins
Your decision on petition dated MAR 01 2005

I am withdrawing my petition under 37 CFR 1.137(b) on the grounds that the decision dated MAR 01 2005 is based on the flawed claim by the Examiner that the Applicant failed to *timely* file a *proper* response to Office Action (OA7) dated March 12 2002: The Examiner in this notification of Abandonment dated January, 2003 failed to explain WHY the response (**App.5**, 31 May 2002) of the Applicant was *improper*. **App. 5 (enclosed)** in fact gave a comprehensive rebuttal to **ALL** the objections raised by the examiner with the exception of compliance with the advice to amend what were considered to be "vague, etc." expressions. The Applicant's response was also timely and well within the set shortened statutory period of 3 months. This notice of Abandonment followed on from the flawed decision of Ms Stone, Technology Center 1700 dated 6 January 2003 (**OA11**) to dismiss the Complaint +Petition of the Applicant dated 5 September 2002:

Quote:

"the final rejection dated March 11, 2002 (**OA7**) is not premature and is justified because the only new grounds of objection and rejection contained in the office action were necessitated by Applicant's amendment filed Nov. 20 2001. **This amendment introduced new matter into both the specification and claims**. Applicant's amendment necessitated the new grounds of rejection presented in the office action."

Ms. Stone is mistaken.

Firstly, no amendments were filed 20 Nov. 2001 (**App.4**). Clean versions of amendments already forwarded 2 April 2001 (**App.3**) were filed. The amendments to the Claims were necessitated by the examiner's objections (**OA4**, 3 March 2001).

- **"Multiple dependent claims (Claims 5-8, 14, 7)"**

All amendments relating to merit were the result of **cancellations** of a considerable amount of material from the Claims of the original IPC transmitted version (**App. 1A**). Conforming with USPTO practice a preamble describing the *state of the art technology* was introduced into Claims 3, 4, 12, 15 preceding the actual claimed innovative content which conformed precisely with that in the IPC transmitted version (**App. 1A**). This preamble is an exact copy of the preamble of the Claims of an antecedent Application (see **Annex B**) already accepted by the same examiner as defining the prior art in the appropriate Patent Classification relating to the present application

- **“Claims 1-4, 9-13, 15, 16, 18-20 rejected under 35 USC 112 as being narrative in form and contain numerous vague and indefinite expressions.”**

The Applicant made no response to this as the examiner, as in the PA 08/503401, failed to explain why the expressions/words are vague and indefinite. The Board of Appeals upheld my complaints in this respect.

NO NEW MATTER WHATSOEVER WAS INTRODUCED INTO EITHER THE SPECIFICATION OR THE CLAIMS.

The response of the Examiner (**OA10**, 2002 Dec. 12) to the Applicant's response (**App. 6**, 2002 August 6) to Office Action (**OA8**, 2002 June 23) provides further proof that the claim that the Applicant had introduced new matter into the disclosure was unfounded.

In this Advisory Action the Examiner's reasons for failing to place the application in condition for allowance includes:

The proposed amendment(s) will not be entered because:

- (a) they raise new issues that would require further consideration and/or search.
- (b) they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal.

Firstly, the Applicant **proposed no amendments in App.6.**

App.6) 2002 August 6 **Applicant's response to Office Action 2002, June 23 (OA8).**
All the objections pertaining to the disclosure related to FORM and were either deleted as suggested by the examiner or rebutted as flawed.

Secondly, the only reason for not placing the Application in a condition for allowance contained in **OA10** was:

Quote:

“the proposed amendment filed August 16, 2002 (**App.6**) cannot be entered because the marked up version of the claims does not correspond to the clean version of the claims”
 This was comprehensively refuted by the Applicant in **App.8**, 2003 March 11. (see **App.8** for details).

The Applicant realising that Ms Stone was mistaken filed a further Petitions to the Commissioner (**App.9**, 2003 March 26 and **App.10**, 2003 April 4).

Quote:

(**App.9**) 2003 March 26: Applicant's PETITION to the Commissioner “to treat the applicant's response (**App.6**) filed 16 Aug. 2002 as timely (Request for Continued Examination) and as basis for determining a Declaration. of Allowance.

(**App.10**) 2003 April 4. Petition to the Commissioner “Pursuant to 37 CFR §1.181, the Applicant petitions the Commissioner to withdraw the holding of abandonment of Application No.: 09/242072 “APPARATUS FOR LIQUID PURIFICATION” and treat the Applicant's response (**App.6** filed 16 August 2002) as timely and as a basis for determining a Declaration of Allowance

"The applicant is convinced that apart from trivial matters of form the **MERITS OF THE CLAIMS from App.3 (April 2001) onwards** were at all times in a condition of Allowance and there are no grounds for declaring a condition of Abandonment at any time during the examination".

Ms Stone once again more or less repeats the reasons given in **OA11** for the rejection of the Petition (**App. 10**).

Ms Stone is again mistaken.

This whole long-winded examination procedure, that has now been dragging on for more than **5 years**, can be resolved simply by comparing the original IPC transmitted version **App.1A** with the latest version contained in **App.6** 2002 August 6.

Except for trivial matters of form the Application was in fact placed in condition of allowance with the filing of mailed **App.3** 2001 April 2. All objections in **OA4** 2001 March 3 concerning matters of MERIT were refuted in **OA4**. The examiner failed to declare this in **OA7** 2002 March 10.

In fact apart from matters of form the original IPC version (App. 1A) was already in a condition of allowance.

The present Specifications are as good as identical.

The defining parts of the Claims in the latest version in **App.6** are identical with the defining parts transferred from **App.1A** and are numbered and marked with colour in the enclosed version:

Claim 1 of both is essentially the same with no new material introduced into **App.6** (marked up).

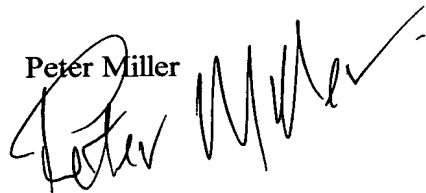
The remaining defining parts of the Claims in App.6 are colour-marked in **App.1A** (enclosed) and contain no new material.

Alone this proves that the allegations of the introduction of new material into the USP Application Disclosure during the last 5 years are completely without foundation.

Enclosed:

Based on this evidence and the further evidence contained in the enclosed copies of "**Chronology of Actions 1999-2005**" and actions **App.1A, OA4, App.3, OA7, App.5, OA8, App.6, OA10, App.8, OA13 and Annex B** the Applicant requests that all previous petition rejections and incurred costs to the Applicant are overturned and that the latest version of the Application is placed in condition for allowance.

Peter Miller



Chronology of actions 1999-2005

uspatcomplaintapril05

App. 09/242072

Filing date: 14 JAN 2000

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MAY 10 2005

OFFICE OF PETITIONS

Background (OA=Office Action / App.=Applicant's Action):

1999

(App.1A) 1999 January 29: IPC application transmittal letter with Declaration mailed to USPTO - "Apparatus for liquid purification".

(App. 1B) 99 Feb.2. - (1F) Dec.24

(OA 1A) 99 June 7 - (1D) Nov.11

2000

(OA1E) 2000 Feb. 8

(App.1G) 2000 Feb.25

(App.1GG) 2000 Apr. 22

(OA 1F) 2000 June 26

(App. 1H) 2000 July 28

(App. 1I) 2000 Aug. 20

(OA2) 2000 Sept. 20

Petition granted / USPTO filing date.

Request for reappraisal

Complaint concerning mail delivery dates

Notification of Abandonment

Complaint concerning Office non-response

Petition to start Examination of Application

Petition granted.

Application forwarded to National Stage Processing

Branch of PTO by PCT Legal Office

(App.2) 2000 October 9:

Applicant mailed amended IPC claims (marked up and clean) to comply with USPTO regulations.

(OA3) 2000 October 25:

PTO mailed Filing Receipt (Acknowledgement of receipt of non-provisional Patent Application (09/242.072).

+

2001

(OA4) 2001 March 3:

PTO mailed Office examination action / Final Rejection

Examiner infringed 37 CFR §1.113(a):

“**On the second** or any subsequent examination or consideration by the examiner the rejection or other action may be made final.....”

A final rejection cannot be made on the **first consideration** by the examiner.

This **final rejection** centered mainly on **matters of the merit** of the claims.

(App.3) 2001 April 2:

Applicant mailed response to **1st Final Rejection**
Matters of MERIT:

- “Claims 10-12, 15, 16 and 18-20 are rejected

under 35 USC 102(b) as being anticipated by Hirs USP 2867325 or 2867326”.

- “Claims 1-4, 9 and 13 are rejected under 35 USC 113(a) as being unpatentable over Whitney (USP 2673176)”.

The Applicant produced arguments to rebut the examiner’s objections on all points.

NB.: Finding no argument to reject these rebuttals concerning MERIT the examiner, according to accepted practice (*Quayle, 1935*) would be obliged in the subsequent Office Action to state that:

“Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed.” Crucially he failed to do so.

Matters of FORM

- “Claims 5-8, 14, 17 objected to under 37 CFR 1.75(c) (multiple dependant claims).

Matter of form. Applicant eliminated all multiple claims in the amended claims.

- “Claims 5-8, 14 and 17 objected to because of matters of form. Claims 1-4, 9-13, 15, 16 and 18-20 are rejected as failing to define the invention in a manner required by 35USC112, second paragraph. The claims are narrative in form and contain numerous vague and indefinite expressions.

The Applicant amended or cancelled all expressions considered to be vague or indefinite both in the claims and description.

#####

(OA5) 2001 Sept. 3: Statutory 6 months from date of mailing of Final
Rejection allowed to lapse by the PTO Examiner.

#####

(OA6) 2001 October 2: Notice of Non-Compliant Amendment (37 CFR
1.121) mailed by Legal Instruments Examiner
(Marked-up Amendments of Description and Claims I
in Applicants response 2001, April 2 not supplied in
“clean” version as well)

(App.4) 2001 October 20: “Clean” versions of amended disclosure in App.3,
2 April 2001 timely mailed to PTO.

2002

(OA7) 2002 March 10

***PTO mailed Office examination action / 2nd Final
Rejection***

“The amendment filed 20 Nov.01 (App.4) is objected to under 35 USC 132
because it introduces new matter into the disclosure”

**The examiner’s further objections refer to the amended
matters of form to conform with his requirements in the 1st
Final Rejection.**

and failed to comply with the examination practice (*Ex parte Quayle*, 1935 CD 11, 453 OG 213) and state that **“except for formal matters, the prosecution as to the merits of the application is closed”**.

Instead, infringing MPEP at 706.07(a) he presented new grounds exclusively of a formal nature for a continued rejection of the application. As discussed in the MPEP at 706.07(a):

“Under present practice, second or any subsequent actions on the merits shall be final except where the examiner introduces a new ground for rejection that is neither necessitated by the applicant’s amendment of the claims nor based on information submitted.....etc.

“No amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: (points 1-7).....”

(App.5) 2002 May 31

Applicant mailed response to **2nd Final Rejection**,

The suggested amendments (1-7) **did not touch on the claims** but only the specification of the disclosure. None of the amendments can be described as new material.

With the exception of Point 4 these amendments were only meant to improve the description of the invention.

“Objection (4) does not concern new material. The original description of pump 28 as a suction/vacuum pump is an error. From the description of its function and the flow sheet Fig. 5 it is obvious that the described function can only be carried out by a pump producing a positive (above atmospheric pressure) outlet pressure. The term suction/pressure pump is normally used for pumps of this nature and applies in the case at hand.”.

All objections of the examiner concerning the CLAIMS were rebutted by the Applicant and proven to be false (see App. 5).

THE APPLICATION IS NOW IN A CONDITION OF ALLOWANCE

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(OA8) 2002, June 23

The examiner further objects to:

In the Specification

Additional minor technical details not touching on the MERITS of the disclosure to further clarify the specification.

In the Claims:

Matters of **FORM** not touching on the MERITS.

(App.6) 2002 August 6

Applicant’s response to Office Action 2002, June 23 (OA8).

All the objections pertaining to the disclosure related to FORM and were either deleted as suggested by the

examiner or rebutted as flawed.

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(OA9) 2002 August 23

PTO communication

Response App.6 deemed to be untimely and **was not considered** by the examiner.

◦ Application will become abandoned unless an extension of time is granted.

(App.7) 2002 Sept. 5

Complaint + Petition *with precautionary application for an extension of time to respond*

(OA10) 2002 Dec. 12

Response to App.6 by examiner.

“the proposed amendment filed August 16, 2002 cannot be centered because the marked up version of the claims does not correspond to the clean version of the claims”

These are clearly new grounds for rejection.

NONE of the amendment introduce new matter into the disclosure.

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2003

2003

(OA11) 2003 January 6

PTO communication (Ms Stone, Technology Center 1700)
PETITION DISMISSED / NOTICE OF
ABANDONMENT

“the final rejection dated March 11, 2002 is not premature and is justified because the only new grounds of objection and rejection contained in the office action were necessitated by Applicant’s amendment filed Nov. 20 2001. **This amendment introduced new matter into both the specification and claims** . Applicant’s amendment necessitated the new grounds of rejection presented in the office action.”

Ms. Stone is mistaken.

Firstly, no amendments were filed 20 Nov. 2001 (**App.4**). Clean versions of amendments already forwarded 2 April 2001 (**App.3**) were filed.

The amendments to the Claims were necessitated by the examiner’s objections (**OA4**. 3 March 2001):

- **Multiple dependent claims (Claims 5-8, 14, 7)**
All amendments relating to merit were the result of **cancellations** of a considerable amount of material from the Claims of the original IPC transmitted version (**App. 1A**)
Conforming with USPTO practice a preamble describing the *state of the art technology* was introduced into Claims 3, 4, 12,15 preceding the actual claimed innovative content which conformed precisely with that in the IPC transmitted version (**App.1A**). This preamble is an exact copy of the preamble of the Claims of an antecedent Application (**see Annex B**) already accepted by the same examiner as defining the prior art in the appropriate Patent Classification for the present application..
- **Claims 1-4, 9-13, 15, 16, 18-20 rejected under 35 USC 112 as being narrative in form and contain numerous vague and indefinite expressions.**
The Applicant made no response to this as the examiner, as in the PA 08/503401 failed to explain why the expressions/words are vague and indefinite. The Board of Appeals upheld my complaints in this respect.

NO NEW MATTER WHATSOEVER WAS INTRODUCED EITHER TO THE SPECIFICATION OR THE CLAIMS

(OA12) 2003 January 13

Office communication (Cintins) NOTICE OF
ABANDONMENT (failure of Applicant to **timely** file a **proper** response to Office Action (OA7) dated 12 March 2002

The examiner failed to explain **WHY** the response (**App.5 31 May 2002**) of the Applicant was **improper**.

App. 5 in fact gave a comprehensive rebuttal to **ALL** the

objections raised by the examiner with the exception of compliance with suggestion to amend what were considered to be "vague, etc." expressions.

The Applicant's response was also timely and well within the set shortened statutory period of 3 months

(App.8) 2003 March 11 Applicant's response to OA10 (12 December 2002)
This is a comprehensive rebuttal of the examiner's objections (see App.8).

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(App.9) 2003 March 26: Applicant's PETITION to the Commissioner "to treat the applicant's response (App.6) filed 16 Aug. 2002 as timely (Request for Continued Examination) and as basis for determining a Declaration of Allowance.

(App.10) 2003 April 4 Petition to the Commissioner Pursuant to 37 CFR §1.181, the Applicant petitions the Commissioner to withdraw the holding of abandonment of Application No.: 09/242072 "APPARATUS FOR LIQUID PURIFICATION" and treat the Applicant's response App.6 filed 16 August 2002 as timely and as a basis for determining a Declaration of Allowance.
"The applicant is convinced that apart from trivial matters of form the MERITS OF THE CLAIMS from App.3 (April 2001) onwards were at all times in a condition of Allowance and there are no grounds for declaring a condition of Abandonment at any time during the examination".

(OA13) 2003 June 6 Petition dismissed by Ms Stone, Technology Center.
"The amendment introduces new matter into BOTH the specification and claims"
"As noted in the Petition Decision mailed January 6, 2003, the examiner has properly considered Applicant's response filed August 16, 2002 (App. 6) and an advisory action was mailed December 12, 2002 (OA 10). The decision also held that the final rejection dated March 13, 2002 is not premature and is justified because the only grounds of objection and rejection contained in the office action were necessitated by Applicant's amendment filed November 20, 2001 That amendment introduced new matter into both the specification and claims. Applicant's amendments necessitated the new ground(s) of rejection presented in the office action." As discussed in the MPEP at 706.07(a):
"Under present practice, second or any subsequent actions on the merits shall be final except where the examiner introduces a new ground for rejection that is neither necessitated by the applicant's amendment of the claims nor based on information submitted.....etc.
Ms Stone's decision cannot be supported by the evidence.
Ms. Stone is mistaken.
Firstly, no amendments were filed 20 Nov. 2001 (App.4). Clean versions of amendments already filed 2 April 2001 (App.3) were filed/forwarded. The amendments to the Claims were necessitated by the examiner's objections (OA4) 3 March 2001:

- **Multiple dependent claims (Claims 5-8, 14, 7)**
All amendments relating to merit were the result of **cancellations** of a considerable amount of material from the Claims of the original IPC transmitted version (App. 1A)
Conforming with USPTO practice a preamble describing the *state of the art technology* was introduced into Claims 3, 4, 12, 15 preceding the actual

claimed innovative content which conformed precisely with that in the IPC transmitted version (**App.1A**). This preamble is an exact copy of the preamble of the Claims of an antecedent Application (see **Annex B**) already accepted by the same examiner as defining the prior art in the appropriate Patent Classification for the present application..

- **Claims 1-4, 9-13, 15, 16, 18-20 rejected under 35 USC 112 as being narrative in form and contain numerous vague and indefinite expressions.** The Applicant made no response to this as the examiner, as in the PA 08/503401 failed to explain why the expressions/words are vague and indefinite. The Board of Appeals upheld my complaints in this respect.

NO NEW MATTER WHATSOEVER WAS INTRODUCED EITHER TO THE SPECIFICATION OR THE CLAIMS

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2004

(App.11) 2004 Feb. 23 **Petition according to CRF371.137(b) to reinstate the abandoned Application on the grounds that it was unintentional.**

(OA 14) 2004 June 8 **Petition (App.11) dismissed.**
“A renewed §1.137(b) petition must include a proper response to the March 23, 2002 final Action. “
§1.137(b)(1):
“(b) Unintentional. Where the delay in reply was unintentional a petition may be filed to revive an abandoned application.... Pursuant to this paragraph a grantable petition must be accompanied by:
(1) the required reply, unless previously filed.

NB The required reply was previously filed.

(App.12) 2004 July 4 **Petition for reinstatement according to §1.137(b)(1) Forms in OA14 completed.**
“disregarding all the intervening Petitions and PO declarations there remains nothing for me as applicant to answer for regarding the examiner’s comments and objections. Nothing stands in the way of Allowance.”

2005

(App.13) 2005 Jan. 05 **Reminder to the PO to respond to App.12.**

(OA.15) 2005 March 1 **Petition (App.12) rejected.**
“On December 10, 2002 the Office mailed an Advisory Action informing petitioner that the August 10, 2002 submission did not place the application in *prima facie* condition for allowance.”
Technology Director Jacqueline Stone (OA13) has affirmed that the March 113, 2002 final action was

justified.

The application became abandoned on September 14, 2002 (OA10).

A notice of abandonment was mailed January, 13, 2003 (OA11).

Petition to revive, filed March 5, 2004 (App.11) was dismissed on June 8, 2004 (OA14) for failure to provide a proper reply.

§37CFR1.137(b) must be accompanied by (1) the required reply, unless previously filed."

NB The required reply was previously filed.

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uspatcomplaintapril05

APP 1A

App 1A

DE - Amendment
22.1.98**APPARATUS FOR LIQUID PURIFICATION****Description**

This invention concerns apparatus for the purification of liquids. By purification is meant the removal of unwanted suspended, colloidal or dissolved substances from a liquid.

The prior art of apparatus to achieve this consists of a large variety of generically related filters that utilize over-pressure and/or under pressure to provide the necessary pressure difference for filtration.

For the purification of liquids, filter presses or pressure leaf, candle and cartridge filters (pressure vessels containing such elements) are mainly utilized. Such liquids are chemicals, pharmaceutical products, beer, wine, sugar, oils and fats, petroleum products, etc. Their purification normally involves some form of "in-depth" filtration or purification process, whereby the liquid to be purified is either passed through or forms thereby a bed of particulate purification aid whereby the separation mechanism is mostly a combination of sieving-action and adsorption. The purification aids that are used include diatomaceous earth (kieselguhr), bleaching earth, ion-exchange resin, activated carbon, etc., all normally in powder form. The solid residues can rarely be regenerated and their disposal poses an acute environmental problem.

On the other hand, using apparatus of the nutsche-type filter in the form of open or closed containers, water is filtered by means of gravity or over-pressure on a large scale by means of thick, static beds of coarse granular material (e.g. sand). These beds are regenerated after filtration by backwashing techniques and reused. Although this method is suitable for the filtration of relatively clean surface and ground water, it is wholly unsatisfactory for the purification of industrial and domestic effluent. The reason is that the back-washing and regeneration techniques of prior art sand filters

- are inadequate for washing out most of the large variety of suspended solids contained in industrial liquid effluent

and

- produce excessive amounts of contaminated backwash liquid.

Added to this, the static nature of the beds is unsuited for the filtration of particulate matter, as large sections of the bed remain unused and the necessity for utilizing relatively coarse granular material comprising the beds for removing organic and inorganic contaminants in solution precludes on economic grounds the possibility of utilizing the extensive range of available adsorbents comprising such materials as activated carbon, anthracite, ion-exchange resin, bleaching earth, molecular sieves, etc. required for removing specific contaminants in the field of effluent and water purification.

The goal of this invention is to further develop the art and science of "in-depth" filtration utilizing beds of loose material for the purification of liquids such as processed by the

-2-

above named industries, whereby the beds are regenerated and reused more effectively than with prior art methods, resulting in a considerable reduction in the quantity of liquid and solid waste for disposal. Considering the present practice, in both the industrial and communal sector, of discharging effluent to the natural environment that is incompletely purified, the further goal is to provide these sectors with an effluent and water purification apparatus that will enable liquid effluent to be recycled and polluted water to be rendered suitable for domestic and industrial purposes.

It is proposed that the apparatus of the invention will be far more compact and versatile compared with the prior art in that it can be installed not only in large industrial and communal plants, but also in the medium to small size industrial sector. This will be achieved by utilizing specific through-puts 10-100 times those normally employed by prior art filters. Specific through-puts of 50-200 m³/m².h will be possible because the beds will be maintained in an "open" condition throughout the filtration and/or purification cycles. A further goal of the invention is to provide the liquid purification apparatus of the invention with the means for automatically selecting and applying varying types and grades of filter media and modes of operation according to the nature, filtration characteristics and requirements of any type of liquid purification operation, whereby no further distinction will be made between effluent, water and process liquid purification. The ultimate aim of the invention is to reduce the number of purification steps presently required for process liquid purification, whereby waste generation will be reduced and the purification media regenerated and reused, thus enhancing the competitiveness of these industries and simultaneously relieving the present impact on the environment. The aim of the invention with industries presently using liquids in their production processes for such operations as plating, dyeing, washing, coating, pickling, quenching, etc. is to provide the means for continuous regeneration to avoid the necessity for dumping into the environment.

THE INVENTION

Fig.1 is a schematic flow-sheet of the apparatus of the invention that consists of a purifying filter plant 1, comprising essentially a lower stationary filtrate chamber 2 with a porous upper surface on which a section of an intermittently movable filter belt 4 is supported which in operation is stationary and sealed at the periphery by vertically movable dependent rim portions 3 of an upper contaminant container 5 fitted with a conically perforated feed distributor 27 extending over the entire upper horizontal section, a bed regeneration apparatus 6, a bed material storage/dosing vessel 7, a filter aid suspension tank 11, one or more adsorbent storage/dosing devices 8, a reservoir for liquid to be purified 10 and a residue filter 9.

Filter aid suspended in liquid in tank 11 is dosed into the vented container 5. While the pressure difference between the container 5 and the lower filtrate chamber 2 is raised, liquid to be purified in reservoir 10, which may be dosed with flocculating

substances such as polyelectrolytes, is pumped using means 22 from reservoir 10 into container 5. Simultaneously, suspensions of bed material recycled from regenerator 6 and activated powdered adsorbents are dosed using means 7/20 & 8/19 under pressure to a mixing section 27 of the delivery conduit 12 controlled by microprocessor 15 from input data from instrumentation 14 and 13 in the delivery conduit 12 and the filtrate conduit 16 respectively. The liquid quality and process parameters (concentration) controlled include turbidity, pH, hardness, chlorinated organics, mineral oil, heavy metals, phosphates, nitrates, etc. as well as variables such as pressure difference and through-put. Filtrate is recycled, if necessary by means of a suction/vacuum pump (28), through conduits 16 & 17 to reservoir 10 until the concentration of contaminants in the filtrate is reduced to a set level as measured at 13. Filtrate flow is switched to conduit 18 whence it is collected in a reservoir not shown. On either reaching a pre-set pressure differential across the bed or a pre-set upper level of contaminant concentration as measured by instrumentation 13, pump 22 and all dosing apparatus are shut down and external gas is fed through conduit 23 to container 5 whereby the residual liquid in the chamber and bed is removed, after which the dependent rim portions 3 of container 5 are raised and the bed is transported by the filter belt 4 and discharged into the bed regenerator 6. The dependent rim portions 3 are lowered onto a fresh section of belt and the cycle described above is repeated. The regenerator 6, in effect, removes adsorbate and entrapped particulate matter (ultrasonics, turbulence, diffusion, etc.) from the internal and external surfaces of the granular material, which may be an adsorbent itself, thereby regenerating, cleaning and restoring the desired activities to these surfaces. Clean liquid is introduced to 6 through conduit 24 and by means of hydraulic classification action the adsorbate and particulate matter are removed through conduit 25 to filter 9 to recover a solid waste. Depending on its nature, the recovered fluid is recycled to 10 or reprocessed. Not shown are the means for introducing and removing the bed regenerating and reactivating fluids to and from bed regenerator 6. Fig.2 is a schematic representation of a partly sectioned elevation of media feeding mechanisms of the invention. Prior art filters have the disadvantage that a replacement of filter media involves lengthy shut-down periods and often excessive manual manipulation. A further goal, therefore, of the present invention is to provide the means for automatically and quickly fitting a large variety of prefabricated materials (e.g. membranes, paper, carton, etc.) to fulfill the requirements of the liquid processing industries. Pressure cylinders 215, normally taking the form of hydraulic or pneumatic rams are provided for actuating the dependent rim portions 3 of the filter container 5 in the vertical direction for bed removal and container closure.

A plurality of rolls of filter media 209, 210 are provided for feeding sections onto the lower filtrate chamber 2. Drive rollers 220, 221 located on the surface of the media rolls and actuated by a brake/clutch mechanism 225 driven by the filter belt 217 through idle

rollers 207, feed lengths of filter band over guides 223 into the rollers 207 onto the surface of the moving filter belt 217. Belt sensor 218 shuts down the belt drive motor 216 and actuates the band slitting mechanism 208 after which the section of filter medium and the supporting filter belt are finally positioned in the container 5 and the depending rim portions of the container are lowered to seal the periphery of said sections. After filtration the used sections of filter medium are normally transported out of the container 1 for disposal.

Cassettes 212, located externally to the filter container 1, are designed to feed pre-cut, pre-fabricated sheets of various types of filter media such as membranes, paper, carton, etc. into the filter container for filtration. Individual sheets are taken from the top of spring-loaded bundles 223 by means of actuated rubberized rollers 213 and fed on guides 224 to synchronously driven feeder belts 214, whereby after positioning on the porous upper surface of the filtrate chamber 2, the dependent rim portions 3 of the container 5 are lowered to seal both the belt and the overlying section of filter medium. After the filtration operation the material is transported out of the container 1 for disposal.

Fig.3 is a sectioned drawing showing an improved method for ensuring that the dependent rims 3 when they take the form of peripheral, integral sides of the container 5 are actuated in the horizontal orientation when raised and lowered and that the full thrust of the fluid driven pistons in cylinders 215 is exerted when sealing the container 5 against the horizontal pervious base 2. The bodies of the cylinders 305 are fixed to an external load-bearing framework 306 with the external extremity of the lubricated shafts 307 connected to the lower ends of vertically sectioned cylindrical sleeves 302 extending and fixed at the top end to transverse beams 308 that in turn actuate thrust shafts 303 acting directly through seals onto the top peripheral part of the container 5. Annular sections of guiding plastic material 307 preferably out of polytetrafluorethylene, are fixed to the surface of the cylinders fitting into the space between the surface of the cylinders and the inner surface of the reciprocating sleeves 302.

Fig.4 is a schematic representation of apparatus of the invention for:

- automatic selection of filter media;
- automatic selection of the optimal mode of filtration or purification;
- automatic measurement of the permeability of sections of filter media;
- automatic regeneration of partially 'blinded' sections of filter media.

A typical procedure according to the invention for the filtration or purification of a quantity of liquid of unknown filtration characteristics is the following:

A liquid is to be clarified, whereby the filtrate in the filter residue (cake) is to be recovered by a washing operation. The required degree of clarification in units of turbidity

is known. This and other pertinent information are entered into the programmed microprocessor 15 and the following sequence of operations proceeds fully automatically:

Start:

1. A section of 10 micron retention filter paper from 212 is automatically fed into the filter container.
2. The dependent rim portions of the container 5 are lowered to seal the section of paper lying on the filtrate chamber.
3. The differential pressure controller 404 establishes a preset pressure differential between the chamber sealing space 402 and the filtrate chamber 403.
4. With the container 1 vented, approx. 15 l/m² of the suspension are introduced to the top container 5 and distributed over the surface of the sealed section of filter paper.
5. Compressed gas is introduced to the top chamber through control valve 407, whereby the gas pressure and flow controllers 405/6 control and indirectly establish the filtration characteristics of the suspension by measuring the volumetric flow of gas in the top container 5. A sample of filtrate flows through a turbidity meter 410 to record the degree of clarity of the filtrate.

.....
The computer 15 chooses the filtration mode and type of medium:

Mode: precoat with medium speed diatomite with 1% body-feed

Medium: 20 micron polyestermonofil section of belt
.....

6. The depending rim portions (3) are raised and the filter paper is discharged.
7. The 20 micron belt section is automatically positioned in the container 1.
8. Steps 3,4,5 are repeated with a liquid of known filtration characteristics.
- 9a. Result of permeability test: negative. The section of belt is subjected to a standard cleaning/regeneration procedure after which steps 3,4,5 are repeated.
- 9b. Result: positive. With the container 1 vented, approx. 20l/m² of diatomite suspension are introduced to the top container 5.
10. While the chamber 5 is being pressurized with gas, suspension to be filtered with 1% diatomite body-feed is introduced under pressure through valve 407. The feed rate is controlled by a pressure differential controller 405. Filtration proceeds.
11. On reaching a preset pressure differential, filtration terminates. Valve 401 shuts.
12. Valve 407 opens. Gas forces rest suspension through the filter cake.
13. Gas flow controller 406 signals a break-through of gas through the filter cake.
14. Valve 407 shuts.
15. The valve 408 opens. A pre-set quantity of wash liquid is fed to the container 5.
16. Valve 408 shuts. Valve 407 opens. Gas forces wash liquid through the cake.
17. The flow controller 406 signals a break-through of gas through the filter cake.

SUBSTITUTE SHEET (Rule 26)

18. Cake drying.
19. The valve 407 shuts. Container is vented by opening 411. Container opens.
20. Belt transport. Cake discharge.
21. Belt wash (belt wash liquid is used for subsequent cake wash operation).
22. 20 micron belt section relocated in the container 1.

-cycle repeated-

Fig.5 & 6 show a schematic representation of an innovative filtrate chamber 2 whereby the fixed pervious bed of the prior art is replaced by manually removable pervious elements 502 to facilitate the cleaning and/or sterilization of the internal surfaces and drainage members 504. According to the invention only planar, smooth surfaces of the floor of the filtrate chamber remain after the manual removal of the elements. In a preferred design, the filtrate chamber consists of a hollowed-out plate 505 with smooth polished upper surfaces on which the removable elements, preferably consisting of expanded sheets or layers of woven mesh of metal or plastics that are covered and integral with flat perforated sheet, mesh or profiled grid material. To accommodate the high liquid throughputs of the invention and to minimize the bulk and cost of the elements, generously proportioned multiple filtrate outlet conduits 506 are provided, preferably coinciding with the intervals of the fluid driven cylinders 215, whereby the conduits are made integral with the supporting framework and designed to support the filtrate chamber as well as to withstand the thrust of the closure of the upper container. These conduits are also designed for ease of access and cleaning.

Fig.7 shows a schematic drawing, wherein the filter web takes the form of a belt that is driven by a motor or actuator 702 to reverse the direction of transport of the belt to enable the discharge of the filter bed or filter cake at either end of the purifying apparatus 1. One of the major advantages of this configuration is that the permanent attachment of a bed regenerator 6 and a filter cake receiver at either end can be achieved.

The above described invention effectively bridges the gap between prior art sand (in-depth) and pressure filters presently employed in the liquid processing industries.

The implications are that both liquid processing and using industries can be rationalized and improved to increase their competitiveness and simultaneously reduce considerably the present negative impact on the environment.

CLAIMS

US ADD CLAIMS
↓
①
1. A liquid-filtering apparatus consisting of a container with an internal lower horizontal, pervious base supporting a bed of loose, granular filter media; whereby the base has the form of a filtrate drainage member or chamber fitted with an outlet nozzle for filtrate and a inlet nozzle for backwash fluids and whereby the upper part of the container has an inlet connection for contaminated liquid at or above atmospheric pressure and an outlet connection for backwash fluids, *thereby characterized*, that the container (1) is divided horizontally at the level of the pervious horizontal base (2), whereby the dependent rim portions (3) of the top section of the container (5) are movable in the vertical direction to facilitate the removal of the bed from the container and whereby the container (5) is fitted with an inlet connection for contaminated liquid and the base (2) is fitted with an outlet nozzle for filtrate.

2. A liquid purifying apparatus according to Claim 1, *thereby characterized*, that a section of movable web of filter medium (4) is interposed between the pervious, horizontal support base (2) and the vertically movable dependent rim portions of the top section of the container (5), thus sealing a section(s) of the web at the periphery in the closed position, whereby in the raised position the filter bed after the purification operation is transported out of the container 1.

3. A liquid purifying apparatus according to claims 1 and 2, *thereby characterized*, that taken alone or in combination,

the bed after the purification operation is discharged into a bed regeneration device (6), whereby the bed material is regenerated and/or cleaned and recycled to the top container (5) of the filter for reuse;

②
the bed after the purification operation is discharged into a bed regeneration device (6), whereby the material of the bed is regenerated and/or cleaned and reactivated after which and before the purification operation, the bed is recycled to the top container (5) of the purifying apparatus (1) for reuse;

④
the bed material, after regeneration and/or cleaning and reactivation, is first recycled to a dosing device (7/20) that before the purification operation feeds the entire bed to the top container (5) of the purifying apparatus (1);

the bed after the purification operation is discharged into a bed regeneration device (6), whence, after regeneration and/or cleaning and reactivation, the bed material is then recycled by a dosing device (7/20) during the course of the purification operation to the filter container (5), whereby the depth of the bed increases incrementally during the course of the purification operation;

a conically perforated distributor (27) extends over the entire internal upper section of the container (5).

4. A liquid purifying apparatus and method according to Claims 1 and 2, *thereby characterized*, that taken alone or in combination,

the bed after the purification operation is discharged into a bed regeneration device (6), whence after regeneration and/or cleaning and activation of the surfaces of the material comprising the bed and before or after being fed to the filter container (5) in advance of the purification operation, the bed material is mixed with a suspension of active material such as bleaching earth, ion-exchange resin, activated carbon, etc., which if necessary has been pretreated with a surface activating medium to enhance its adhesion to the surface of the material comprising the bed;

the bed after the purification operation is discharged into a bed regeneration device (6). whence, after regeneration and/or cleaning and activation of the internal and external surfaces of the material comprising the bed, it is mixed with active material such as bleaching earth, activated carbon, etc. which is preferably pretreated with a surface activating medium to promote adhesion to the surface of the material comprising the bed and is dosed by a dosing device (7/20) to the feed of liquid to be purified from a reservoir (10) and thereby mixed in a mixing device (29) with the said feed either before or after entry into the filter container (5) during the purification operation or alternatively, the said material comprising the bed and the said active material are dosed separately by devices (7/20) and (8/19) respectively and mixed before or after being dosed to the liquid to be purified from reservoir 10 with which they are also mixed either before or after entry into the filter container (5).

5. A liquid purifying apparatus according to Claim 3 and 4, *thereby characterized*, that the dosing devices (7/20) and (8/19) are controlled by a microprocessor (15) from input signals from feed and filtrate instrumentation (13, 14).

6. A liquid purifying apparatus and method according to Clause 1 and 2, *thereby*

characterized, that taken individually or in combination, the filter web takes the form of an endless belt consisting of a plurality of sections (201, 202, 203) providing different degrees of filtrate quality or consisting of different materials;

the filter web takes the form of an endless belt consisting of a plurality of sections, whereby means (204, 205, 206) are provided for individually removing and replacing each section and automatically locating each section on the pervious, horizontal support base (2) by means of one or more electronic sensors (218) fixed to the frame of the apparatus and one or more electronically sensitive inserts (219) in the edges of the belt.

the filter web takes the form of a filter belt, whereby sections of it are used as support and transport means for introducing strips of pre-fabricated filter material from storage rolls located externally to the purification apparatus 1, whereby the strips are fed onto the filter belt by means of a belt-driven roller combination (207) and whereby after a set length of filter material has been fed onto the porous base (2) the strip is cut to size by the slitting device (208), after which the dependent rim portions of the container (5) are lowered onto the strip of filter material and the section of support belt against the pervious, horizontal support base 2;

12 the filter web takes the form of a filter belt; whereby sections of it are used as support and transport means for introducing strips of pre-fabricated portions of filter material from storage cassettes (226) located externally to the purification apparatus 1 from where single strips of filter medium (211, 212) are mechanically fed by the feeding mechanism (214, 213) and belt-driven roller combination (207) onto the pervious filtrate base (2) after which the dependent rim portions (3) are lowered to seal the strip of filter material and section of support belt against the pervious, horizontal support base (2);

the filter web takes the form of a filter belt, whereby sections of it, sealed by dependent rim portions 3, are used as support for dosed layers of suspension of filter aid fibres such as cellulose, glass, asbestos, etc. or powders such as diatomaceous earth, perlite, molecular sieves, etc. from an external dosing means (11), after which the pressure difference between the container (5) and the filtrate chamber (2) is increased with the introduction to the container (5) of liquid to be purified from a reservoir (10) and optionally a dosed quantity of a suspension of adsorbent or filter bed material from dosing means (7), whereby the formed layer of filter aid acts as either the primary ~~filter~~ medium or as a support and polishing or security layer for removing any particulate or dissolved matter escaping from the formed or forming bed;

means are provided for moving the dependent rim portions of the container (5) vertically, consisting of laterally positioned fluid driven pistons (304) contained in cylinders (215), the bodies of which are fixed to a load-bearing framework (306) with the external extremity of the lubricated shafts (307) connected to sectioned concentric cylindrical sleeves (301) extending and fixed to the extremities of transverse beams (308) that in turn actuate thrust shafts (303) acting on the peripheral part of the upper container (5), whereby to ensure the movement of the dependent rim portions in the horizontal position, ring sections of a suitable material such as polytetrafluorethylene (302) are fixed to the surfaces of the bodies of the fluid driven cylinders (215) and fitted in the annular space between the cylinder surfaces and the internal surfaces of the reciprocating sleeves (301);

the filter web takes the form of a filter belt, whereby the pervious horizontal base (2) supporting a section of the belt consists of a recessed plate (505) containing a plurality of manually removable, belt supporting, filtrate drainage members (502) preferably made up of upper perforated sheet material (503) integrated with a lower layer or layers of such materials as woven mesh or expanded sheet material (504), whereby the upper perforated sheet material lies flush with the peripheral sealing portions of the plate (505);

the filter web takes the form of a filter belt, whereby the means in the form of a suitable motor or actuator (702) is provided to reverse the direction of the transport of the belt to discharge the filter bed at either end of the purifying apparatus (1).

A liquid purification apparatus and method according to Claim 6, *thereby characterized*, that taken individually or in combination,

means in the form of a gas pressure differential controller (405), a gas flow controller (406) and a gas flow control valve (407) provided in a compressed gas conduit (403) leading into the upper portion of the filter container (5) to control and record the volumetric gas flow into the said container and thereby provide a measure of the rate of filtration of a layer of liquid with unknown filtration characteristics lying on a section of sealed filter medium supported by a horizontal pervious support base (2);

means in the form of a programmed microprocessor (15) that receives data from instrumentation such as (405, 406) and/or (13) and/or (14) regarding the filtration characteristics and quality of a liquid processed by the purifying apparatus (1) and chooses and positions the type or types of media and mode of purification and/or

movement of the container in the horizontal position, ring sections of a suitable material such as polytetrafluorethylene 305 are fixed to the surfaces of the bodies of the hydraulic cylinders and fitted in the annular space between the cylinder surfaces and the internal surfaces of the reciprocating sleeves 304;

the filter web takes the form of a filter belt, whereby the pervious horizontal base 2 supporting a section of the belt consists of a recessed plate 505 containing a plurality of manually removable, belt supporting, filtrate drainage members 502 preferably made up of upper perforated sheet material 503 integrated with a lower layer or layers of such materials as woven mesh or expanded sheet material 504, whereby the upper perforated sheet material lies flush with the peripheral sealing portions of the plate 505.

the filter web takes the form of a filter belt, whereby the means in the form of a suitable motor or actuator 702 is provided to reverse the direction of the transport of the belt to discharge the filter bed at either end of the purifying apparatus 1.

8. A liquid purification apparatus and method according to Claim 6, ⁷thereby characterized, that taken individually or in combination,

(15) means in the form of a gas pressure differential controller 405, a gas flow controller 406 and a gas flow control valve 407 provided in a compressed gas conduit 403 leading into the upper portion of the filter container 5 to control and record the volumetric gas flow into the said container and thereby provide a measure of the rate of filtration of a layer of liquid with unknown filtration characteristics lying on a section of sealed filter medium supported by a horizontal pervious support base 2;

means in the form of a programmed microprocessor 15 that receives data from instrumentation such as 405, 406 and/or 13 and/or 14 regarding the filtration characteristics and quality of a liquid processed by the filter apparatus 1 and chooses and positions a type or types of media and mode of purification and/or filtration to achieve previously manually chosen menu of results;

(16) means in the form of a programmed microprocessor 15 that receives data from instrumentation such as 405, 406 and/or 13 and/or 14 regarding the filtration characteristics of any given section of medium sealed by the container 5 and if necessary automatically either initiates a regeneration and/or renewal operation;

means in the form of a gas pressure differential controller (405), a gas flow controller 406 and a gas flow control valve 407 provided in a compressed gas conduit 403 leading

into the upper portion of the filter container 5 to control and record the volumetric gas flow into the said container and thereby provide a measure of the rate of filtration of a layer of liquid with known filtration characteristics lying on a section of sealed filter medium with unknown filtration characteristics supported by a horizontal pervious support base 2;

means in the form of a programmed microprocessor 15 that receives data from instrumentation such as 405, 406 and/or 13 and/or 14 regarding the filtration characteristics and quality of a liquid processed by the filter apparatus 1 and chooses and positions a type or types of media and mode of purification and/or filtration to achieve a previously manually chosen menu of results;

means in the form of a programmed microprocessor 15 that receives data from instrumentation such as 405, 406 and/or 13 and/or 14 regarding the filtration characteristics of any given section of medium sealed by the container 5 and if necessary automatically either initiates a regeneration and/or renewal operation;

OA4

Office Action Summary

Application No.
09/242,072

Applicant(s)

Miller

Examiner
Ivare C. Cintine

Group Art Unit
1724

- ☐ Responsive to communication(s) filed on _____
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

- ☒ Claim(s) 1-20 is/are pending in the application.
- Of the above, claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-4, 9-13, 15, 16, and 18-20 is/are rejected.
- ☒ Claim(s) 5-8, 14, and 17 is/are objected to.
- ☐ Claims _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been
- ☒ received.
- ☐ received in Application No. (Series Code/Serial Number) _____
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- *Certified copies not received: _____
- ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- ☒ Notice of References Cited, PTO-892
- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☐ Interview Summary, PTO-413
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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MAY 10 2005
OFFICE OF PETITIONS

Art Unit: 1724

Claims 5-8, 14 and 17 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim must refer to other claims in the alternative only. Accordingly, these claims have not been further treated on the merits.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4, 9-13, 15, 16 and 18-20 are rejected as failing to define the invention in the manner required by 35 U.S.C. 112, second paragraph. The claims are narrative in form and contain numerous vague and indefinite expressions. For example, the terms: "such as" (claim 1, lines 2 and 8; and claim 18, line 8), "preferably" (claim 1, line 7; and claim 19, line 4)), "thereby characterized" (claims 1-4, 9, 13, 15 and 16), "vicinity" (claim 1, line 13), "in such a way" (claim 1, line 13), "as well as" (claim 10, line 21), "are used as" (claim 12, lines 1-2), "appropriate" (claim 12, line 3), "first of all" (claim 13, lines 2-3), "Apparatus and method" (claims 15 and 16), "according to the defining preamble" (claim 15, line 1), "are employed" (claim 15, line 5), "known quality" (claim 15, line 7), "such as" (claim 16, line 3), and "choose and implement the supply of the optimal

Art Unit: 1724

filter medium" (claim 16, lines 4-5) are vague, and indefinite as to the limitations intended.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 10-12, 15, 16 and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by either Hirs patent (U.S. Patent No. 2,867,325 or 2,867,326). Each reference discloses a liquid filtering apparatus containing a web of filtering media in combination with control means for isolating portions of the filter web during use; and, particularly in view of the indefiniteness of the claims, this is all that appears to be required by claims 10-12, 15, 16 and 18-20.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Art Unit: 1724

Claims 1-4, 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whitney (U.S. Patent No. 2,673,176) in view of either Hirs patent. Whitney discloses a liquid purification system comprising a particulate bed supported on a "porous floor", and further discloses means for regenerating and recycling treatment material. Accordingly, this primary reference discloses the claimed invention with the exception of the recited moveable dependent rim portions. Each of the Hirs patents discloses a filtration system having sealing mechanisms comprising moveable dependent rim portions; and it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the system of the primary reference with the sealing mechanism of either secondary reference, in order to provide improved sealing for the treatment material of this primary reference system.

* The disclosure is objected to because the specification fails to contain a brief description of the drawings.

Appropriate correction is required.

Bahr (U.S. Patent No. 4,906,369) and Salminen (U.S. Patent No. 5,482,594) disclose similar liquid purification systems.

An examination of this application reveals that Applicant is unfamiliar with patent prosecuting procedure. While an inventor may prosecute the application, lack of skill in this field

A: Init: 1724

usually acts as a liability in affording the maximum protection for the invention disclosed. Applicant is advised to secure the services of a registered patent attorney or agent to prosecute the application, since the value of a patent is largely dependent upon skillful preparation and prosecution. The Office cannot aid in selecting an attorney or agent.

Applicant is advised of the availability of the publication "Attorneys and Agents Registered to Practice Before the U.S. Patent and Trademark Office." This publication is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to I. Cintins whose telephone number is (703) 308-3840. The examiner can normally be reached on Monday through Friday from 9:30 AM to 6:00 PM.

The fax phone numbers for this art unit are: (703) 305-3599 for "Official" faxes after Final Rejection; (703) 305-7718 for all other "Official" faxes; and (703) 305-3602 for "Draft" and other "Unofficial" faxes.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Ivars Cintins
Ivars C. Cintins
Primary Examiner
Art Unit 1724

I. Cintins
March 3, 2001

Notice of References CitedApplication No.
09/242,072

Applicant(s)

Miller

Examiner

Ivare C. Cintina

Group Art Unit

1724

Page 1 of 1

U.S. PATENT DOCUMENTS

| | DOCUMENT NO. | DATE | NAME | CLASS | SUBCLASS |
|---|--------------|--------|----------|-------|----------|
| A | 2,673,176 | 3/1954 | Whitney | 210 | 189 |
| B | 2,867,325 | 1/1959 | Hirs | 210 | 387 |
| C | 2,867,328 | 1/1959 | Hirs | 210 | 387 |
| D | 4,906,369 | 3/1990 | Bahr | 210 | 401 |
| E | 5,482,594 | 1/1996 | Salminen | 210 | 400 |
| F | | | | | |
| G | | | | | |
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| I | | | | | |
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| K | | | | | |
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FOREIGN PATENT DOCUMENTS

| | DOCUMENT NO. | DATE | COUNTRY | NAME | CLASS | SUBCLASS |
|---|--------------|------|---------|------|-------|----------|
| N | | | | | | |
| O | | | | | | |
| P | | | | | | |
| Q | | | | | | |
| R | | | | | | |
| S | | | | | | |

NON-PATENT DOCUMENTS

| | DOCUMENT (Including Author, Title, Source, and Pertinent Pages) | DATE |
|---|---|------|
| U | | |
| V | | |
| W | | |
| X | | |

App 3

Peter Miller
See Str.27
71229 Leonberg
Germany

2.4.2001

Commissioner of Patents and
Trademarks
Washington DC 20231

Re. US Appl.No: 09/242072
Int. Appl. No.; PCT/AU96/00442
Filing Date: 05 AUG 96
Office Action dated March 3, 2001

Office Action:

| | |
|-------------------------------|-------------|
| Claims 1-20 | pending |
| Claims 1-4, 9-13, 15,16,18-20 | rejected |
| Claims 5-8, 14, 17 | objected to |

- Claims 5-8, 14, 17 objected to under 37 CFR 1.75 (c) (multiple dependent claims).

All multiple claims have been eliminated in the amended claims.

- Claims 1-4, 9-13, 15, 16, 18-20 rejected under 35 USC 112 (narrative in form and contain numerous vague and indefinite expressions)

All suspect expressions have been eliminated from both the amended DESCRIPTION and CLAIMS.

- Claims 10-12, 15, 16, 18-20 rejected (anticipated by Hirs patent)
 - Claims 10 and 11 have been cancelled in the amended claims.
 - The original and amended and now **independent claim 12** is in no way anticipated by Hirs patent. There is no evidence in this patent of the anticipation of the use of separate sheets of media for the purpose of process control or any other purpose.
 - The original as well as the amended and now **independent claim 15** is in no way anticipated by Hirs patent. There is absolutely no reference or even hint in his patent concerning means to measure the instantaneous rate of filtration by determining the volumetric flow of gas in the contaminant chamber during the filtration operation.

- Also in the amended now **independent claim 16** there is no anticipation in Hirs patent of the means for or even the concept of carrying out pre-testing of suspensions of unknown filtration characteristics by means of single sheets of medium of known filtration characteristics as well as carrying out permeability determinations during operation on sections of a permanent belt medium for purposes of control.
 - **Claims 18-20** are cancelled.
- Claims 1-4, 9, 13 rejected under 35 USC 103 (a) (unpatentable over Whitney in view of either of Hirs patents).
 - **Claims 1-3.** Although an anticipation in Hirs patent of the **independent claim 1** seems unlikely in view of the preamble describing the prior art that belongs to an entirely foreign classification, namely, technology dealing with loose, granular filter medium. However, the applicant is anxious to avoid a controversy on this issue and it seems appropriate to base decisions on inventive merit etc. taking Hirs technology as the prior art. This being the case the preamble to the amended claims 1-3 now takes the form similar to that of the preamble of the original Claim 10. This prior art is totally devoid of the means for or concept of using the filter belt as support for and conveyor of beds of granular material to transport them to a bed regeneration device where the surfaces of the grains are cleaned and reactivated and then recycled to the contaminant filter chamber for subsequent filtration or purification cycles. The idea of fitting the Whitney filter with contaminant chambers of the present invention is too far-fetched to deserve any serious consideration. The examiner maintains that it would be obvious to anyone skilled in the art at the time the invention (1954/59) was made to provide the system of the primary reference with the sealing mechanism of either secondary reference in order to provide improved sealing for the treatment material of this primary reference system. Whether it can or not is irrelevant for judging the merits of the system of the present application. **What needs clarification is the question as to whether the system of the primary reference in view of the secondary reference is capable of carrying out communal water purification with regenerative beds of sand.** The answer is NO.

- The amended **Claim 4** now made dependent on the amended Claim 1 has in no way been anticipated the primary and secondary references.
 - The amended **Claim 9** is central to the operation of the system of the present invention. One distributor of the primary reference consists of a spray head (44) and filter cloth (29) which are entirely unsuited for distributing a slurry of granular material such as sand. The same can be said for the further described "spreaders" (13) and (16) of the thick slurry feed.
An important key to the present innovation described as as a "conically perforated distributor (27). The primary function is to evenly distribute a large throughput over a sealed section of filter belt and avoid any tendency to "hold-up" of the granular material on the distributor. This is achieved by eliminating all flat surfaces or extended horizontal lineal parts (e.g. perforated pipe) over the entire extent of the top of the distributor plate.
 - **Claim 13** is cancelled.
- A brief description of the drawings is now given.
 - Fig. 2 is amended to better show the dependent rim and eliminate numbers not appearing in the specification.

Enclosed: Amended Specification P. 1-12
 Discette electronic copy (MS word)
 Amended Drawing Fig. 2 (x2)

MARKED-UP AMENDED VERSION App. 3 (2 April 2001)

APPARATUS FOR LIQUID PURIFICATION

uspawaterBamend1

Description

This invention concerns apparatus for the purification of liquids. By purification is meant the removal of unwanted suspended, colloidal or dissolved substances from a liquid.

The prior art apparatus to achieve this consists of a large variety of generically related filters that utilize over-pressure and/or under-pressure to provide the necessary pressure difference for filtration.

For the purification of liquids, filter presses or pressure leaf, candle and cartridge filters (pressure vessels containing such elements) are **[mainly]** utilized. Such liquids are chemicals, pharmaceutical products, beer, wine, sugar, oils and fats, petroleum products, etc. Their purification **[normally]** involves [some form of] **an** "in-depth" filtration or purification process, whereby the liquid to be purified is either passed through or forms thereby a bed of particulate purification aid, whereby the separation mechanism is **[mostly]** a combination of sieving-action and adsorption. The purification aids that are used include diatomaceous earth, bleaching earth, ion-exchange resin and activated carbon **[,etc., all normally]** in powder form. The solid residues can **[rarely]** not be **economically** regenerated and their disposal poses an acute environmental problem.

On the other hand, using apparatus of the nutsche-type filter **[in the form of]** **with** open or closed containers, water is filtered by means of gravity or over-pressure on a large scale by means of thick, static beds of coarse granular material (e.g. sand). These beds are regenerated after filtration by back-washing techniques and reused. Although this method is suitable for the filtration of relatively clean surface and ground water, it is wholly unsatisfactory for the purification of industrial and domestic effluent. The reason is that the back-washing and regeneration techniques of prior art sand filters

- are inadequate for washing out **[most of]** the large variety of suspended solids contained in industrial liquid effluent.

[and]

- produce excessive amounts of contaminated back-wash liquid.

and

- **[Added to this,]** the static nature of the beds is unsuited for the filtration of particulate matter as large sections of the bed remain unused **[and the necessity for utilizing relatively coarse granular material comprising the beds for removing organic and inorganic contaminants in solution] thus [precludes] precluding [on economic grounds]** the possibility of utilizing the extensive range of available adsorbents comprising such materials as activated carbon, anthracite, ion-exchange resins, bleaching earth, molecular sieves, etc. required for removing **relatively small concentrations** of specific **organic and inorganic** contaminants **in solution and in a colloidal state** in the field of effluent and water purification.
- **Prior art sand filtration inherently lacks the flexibility and versatility to handle today's demanding liquid purification requirements in the liquid processing industries.**

The goal of this invention is to further develop the art and science of “in-depth” filtration utilizing beds of loose material for the purification of liquids such as processed by the above named industries, whereby the beds for reuse are regenerated **[and reused]** more effectively than with prior art methods, resulting in a considerable reduction in the quantity of liquid and solid waste generation. **[for disposal.]**

Considering the present practice in both the industrial and communal sectors of discharging effluent to the natural environment that is incompletely purified, the further goal is to provide these sectors with an effluent and water purification apparatus that will enable liquid effluent to be recycled and polluted water to be rendered suitable for domestic and industrial purposes.

It is further proposed that the apparatus of the invention will be far more compact and versatile compared with the prior art in that it can be installed not only in large industrial and communal plants, but also in the medium to small size industrial sectors. This will be achieved by utilizing specific through-puts 10-100 times those normally employed by prior art filters. Specific through-puts of 50-200 m³/m².h will be possible because the beds will be maintained in the “open” condition throughout the filtration and/or purification cycles. Yet a **[A]** further goal of the invention is to provide the liquid purification apparatus of the invention with the means for automatically selecting and applying varying types and grades of filter media and modes of operation according to the nature, filtration characteristics and requirements of any type of liquid purification operation, whereby no further distinction will be made between effluent, water and process liquid purification. The ultimate aim of the invention is to reduce the number of purification steps presently required for process liquid purification, whereby waste generation will be reduced and the purification media regenerated and reused, thus enhancing the competitiveness of these industries and simultaneously relieving the present negative impact on the environment. **[The aim of the invention with]** As for industries presently using liquids in their production processes for such operations as plating, dyeing, washing, coating, pickling, quenching, etc. the aim is to provide the means for **[continuous]** total media regeneration to avoid altogether the necessity for waste dumping into the environment.

THE INVENTION

Fig. 1 is a schematic flow-sheet of the apparatus of the invention.

Fig. 2 is a schematic representation of a partly sectioned elevation of the media feeding mechanisms of the invention.

Fig. 3 is a sectioned drawing illustrating an improved apparatus for controlling the vertical movement of the container.

Fig. 4 shows apparatus for the control of the liquid purification process and filter operation.

Fig. 5 illustrates an innovative filtrate chamber design.

Fig. 6 shows schematically the concept of the reversible belt transport of the invention.

[Fig. 1 is a] The schematic flow-sheet of the apparatus of the invention **Fig.1** **[that consists of a]** shows the purifying filter plant 1, comprising essentially a lower stationary filtrate chamber 2 with a porous upper surface on which a section of an intermittently movable filter belt 4 is supported which in operation is stationary and sealed at the periphery by vertically movable dependent rim portions 3 of an upper contaminant container 5 fitted with a

conically perforated feed distributor 27 extending over the entire upper horizontal section, a bed regeneration apparatus 6, a bed material storage/dosing [vessel] device 7/20, a filter aid suspension tank 11, one or more adsorbent storage/dosing devices 8/19, a reservoir for liquid to be purified 10 and a residue filter 9.

Filter aid suspended in liquid in tank 11 is dosed into the vented container 5. While the pressure difference between the container 5 and the lower filtrate chamber 2 is raised, liquid to be purified in reservoir 10, which may be dosed with flocculating substances such as polyelectrolytes, is pumped using means 22 from reservoir 10 into container 5. Simultaneously, suspensions of bed material recycled from regenerator 6 and activated powdered adsorbents are dosed using means 7/20 and 8/19 under pressure to a mixing section [27] 29 of the delivery conduit 12 controlled by microprocessor 15 from input data from instrumentation 14 and 13 in the delivery conduit 12 and the filtrate conduit 16 respectively. The liquid quality and process parameters (concentration) controlled include turbidity, pH, hardness, chlorinated [organics] organic substances, mineral oil, heavy metals, phosphates, nitrates, etc. as well as process variables such as pressure differential and through-put. Filtrate is recycled, if necessary, by means of a suction/[vacuum] pressure pump 28, through conduits 16, 17 to reservoir 10 until the concentration of contaminants in the filtrate is reduced to a set level as measured at 13. Filtrate flow is then switched to conduit 18 whence it is collected in a reservoir not shown. On reaching a pre-set pressure differential across the bed or a pre-set upper level of contaminant concentration as measured by instrumentation 13, pump 22 and all dosing apparatus are shut down and external gas is fed through conduit 23 to container 5 whereby the residual liquid in the chamber and bed is removed, after which the dependent rim portions 3 of the container 5 are raised and the bed is transported by the filter belt 4 and discharged into the bed regenerator 6. The dependent rim portions 3 are lowered onto a fresh section of belt and the cycle described above is repeated. The regenerator 6, in effect, removes adsorbate and entrapped particulate matter [(] by means of ultra-sonic devices, turbulence producing devices, diffusion enhancing processes, etc.[)] from the internal and external surfaces of the granular material, [which may be an adsorbent itself,] thereby regenerating, cleaning and restoring the desired activities to these surfaces. Clean liquid is introduced to 6 through conduit 24 and by means of hydraulic classification action the adsorbate and particulate matter are removed through conduit 25 to filter 9 to recover a solid waste. Depending on its nature, the recovered fluid is recycled to 10 or reprocessed. Not shown are the means for introducing and removing the bed regenerating and reactivating fluids to and from bed regenerator 6.

Fig. 2 is a schematic representation of a partly sectioned elevation of the media feeding mechanisms of the invention. Prior art filters have the disadvantage that a replacement of the filter medium involves lengthy shut-down periods and often excessive manual manipulation. A further goal, therefore, of the present invention is to provide the means for automatically and quickly fitting a large variety of prefabricated materials (e.g. membranes, paper, carton, etc.) to fulfil the requirements of the liquid processing industries. Pressure cylinders 215, normally [taking the form of] hydraulic or pneumatic rams, are provided for actuating the dependent rim portions of the filter container 5 in the vertical direction for bed removal and container closure and sealing.

A plurality of rolls of filter media 209, 210 are provided for feeding sections onto the lower filtrate chamber 2. Drive rollers 220, 221 located on the surface of the media rolls and actuated by a brake/clutch mechanism 225 driven by the filter belt 217 through idle rollers 207 feed lengths of filter band over a **[guides] guide 223** into the rollers 207 onto the surface of the moving filter belt 217. Belt sensor 218 shuts down the belt drive motor 216 and actuates the band slitting mechanism 208 after which the **[section] sections** of filter medium and the supporting filter belt are finally positioned in the container 5 and the depending rim portions of the container are lowered to seal the periphery of said sections. After filtration the used **[sections] section** of filter medium **[are] is [normally]** transported out of the container 1 for disposal. Cassettes 212, located externally to the filter container 1, are designed to feed pre-cut, pre-fabricated sheets of various types of filter media such as membranes, paper, carton, etc. into the filter container for filtration. Individual sheets are taken from the top of spring-loaded bundles 223 by means of actuated rubberized rollers 213 and fed on guides 224 to synchronously driven feeder **belt or belts 214**, whereby after positioning on the porous upper surface of the filtrate chamber 2, the dependent rim portions 3 of the container 5 are lowered to seal both the belt and the overlying section of filter medium. After the filtration operation the **[material] section of filter medium** is transported out of the container 1 for disposal.

Fig.3 is a sectioned drawing showing an improved method for ensuring that the dependent rims 3 **[when they take the form of] as** peripheral, integral sides of the container 5 are actuated in the horizontal orientation when raised and lowered and that the full thrust of the fluid driven pistons in **the** cylinders 215/304 is exerted when sealing the container 5 against the horizontal pervious base 2. The bodies of the cylinders 305 are fixed to an external load-bearing framework 306 with the external extremity of the lubricated shafts 307 connected to the lower ends of vertically sectioned cylindrical sleeves **[302] 301** extending **to** and fixed at the **[top end to] ends of** transverse beams 308 **[that] which** in turn actuate thrust shafts 303 acting directly through seals onto the top peripheral part of the container 5. Annular sections of guiding plastic material **[301] 302 [preferably out of polytetrafluorethylene,]** are fixed to the surface of the cylinders fitting into spaces between the surface of the cylinders and the inner surface of the reciprocating sleeves **[302] 301**.

Fig. 4 is a schematic representation of **part of the** apparatus of the invention for **controlling the**

- automatic selection of filter media;
- automatic selection of the optimal mode of filtration or purification;
- automatic measurement of the permeability of sections of filter media;
- automatic regeneration of partially "blinded" sections of filter media.

A typical procedure according to the invention for the filtration or purification of a quantity of liquid of unknown filtration characteristics is the following: A liquid is to be clarified, whereby the filtrate in the filter residue (cake) is to be recovered by a washing operation. The required degree of clarification in units of turbidity is known. This and other pertinent **[information] data** are entered into the programmed microprocessor 15 and the following sequence of operations proceeds fully automatically:

Start

Testing:

1. A section of 10 micron retention filter paper from 212 is automatically fed into the container.
2. The dependent rim portions of the container 5 are lowered to seal the section of paper lying on the filtrate chamber.
3. The differential pressure controller 404 establishes a pre-set pressure differential between the chamber sealing space 402 and the filtrate chamber 403.
4. With the container 1 vented, approx. 15 l/m² of the suspension are introduced to the top container 5 and distributed over the surface of the sealed section of filter paper.
5. Compressed gas is introduced to the top chamber through control valve 407, whereby the gas pressure and flow controllers 405/6 control the filtration operation and provide the data input to the microprocessor for computing [indirectly establish] the filtration characteristics of the suspension by [measuring] determining the instantaneous volumetric flow of gas in the top container 5. Simultaneously, [A sample of] filtrate flows through a turbidity meter 410 to record the degree of clarity of the filtrate for input to the microprocessor.

.....
The computer chooses the filtration mode and type of medium.

Mode: pre-coat with medium speed diatomite with 1% body feed.

Medium: 20 micron polyester[-monofil] mono-filament section of belt.

6. The [depending] dependent rim portions 3 are raised and the filter paper is discharged.
7. The 20 micron belt section is automatically positioned in the container 1.
8. Steps 3,4,5 are repeated with a liquid of known filtration characteristics.
9. (a) Result of permeability test: negative. The section of belt is subjected to a standard cleaning/regeneration procedure after which steps 3,4,5 are repeated.
(b) Result: positive. With the container 1 vented, approx. 20 l/m² of diatomite suspension are introduced to the top container 5. Filtration Operation:
10. While the chamber 5 is being pressurised with gas, suspension to be filtered with 1% diatomite body-feed is introduced under pressure through valve 401. The feed rate is controlled by a pressure differential controller 405. Filtration proceeds.
11. On reaching a pre-set pressure differential, filtration terminates. Valve 401 shuts.
12. Valve 407 opens. Gas forces rest suspension through the filter cake.
13. Gas flow controller 406 signals a break-through of gas through the filter cake. Cake
- Washing:
14. Valve 407 shuts.
15. Valve 408 opens. A pre-set quantity of wash liquid is fed to the container 5.
16. Valve 408 shuts. Valve 407 opens. Gas forces wash liquid through the cake.

17. The flow controller 406 signals a break-through of gas through the filter cake. Cake

Drying:

18. **[Cake drying.] Gas continues to flow through the filter cake.**
19. **Timer shuts valve [Valve] 407 [shuts.]** Container is vented by opening 411. Container opens.

Cake Discharge:

20. Belt transport. **[Cake discharge.]**
21. Belt wash (belt wash liquid is used for subsequent cake wash operation).
22. 20 micron belt section relocated in the container 1.
-cycle repeated-

Fig. 5, 6 show a schematic representation of an innovative filtrate chamber 2, whereby the **prior art** fixed pervious bed **[of the prior art]** is replaced by manually removable pervious elements 502 to facilitate the cleaning and/or sterilization of the internal surfaces and drainage members 504. According to the invention only planar, smooth surfaces of the floor of the filter chamber remain after the manual removal of the elements. In a preferred design, the filtrate chamber consists of hollowed-out plate 505 with smooth polished upper surfaces on which the removable elements, **[preferably]** consisting of expanded sheets or layers of woven mesh of metal or plastics **[that] which** are covered and are integral with flat perforated sheet, mesh or profiled grid material. To accommodate the high liquid through-puts of the invention and to minimize the bulk and cost of the elements, generously proportioned multiple filtrate outlet conduits 506 are provided, **[preferably]** coinciding with the **[intervals] intervals** of the fluid driven cylinders 215, whereby the conduits are made integral with the supporting framework and designed to support the filtrate chamber as well as to withstand the thrust of the closure of the upper container. These conduits are also designed for ease of access and cleaning. **Fig. 7** shows a schematic drawing, wherein the filter web **[takes the form] consists** of a belt that is driven by a motor or actuator 702 to reverse the direction of transport of the belt to enable the discharge of the filter bed or filter cake at either end of the purifying apparatus 1. One of the major advantages of this configuration is that the permanent attachment of a bed regenerator 6 and a filter cake receiver at either end can be **[achieved.] accommodated.**

The above described invention effectively bridges the gap between prior art sand (in-depth) and pressure filters presently employed in the liquid processing industries.

The implications are that both liquid processing and using industries can be rationalized and improved to increase their competitiveness and simultaneously reduce **[considerable] considerably** the present negative impact on the environment.

MARKED-UP AMENDED VERSION App.3

(2 April 2001)

CLAIMS

usapwaterclaims

1. CANCELLED

[Liquid filtering apparatus in the form of an open or closed vessel containing deep, static beds of coarse granular material such as sand acting as filter medium supported on a porous floor that divides the vessel into an upper turbid liquid chamber with an inlet nozzle or connection and an upper outlet or connection for the removal of bed back-washing liquid and a lower filtrate chamber with a back-washing liquid inlet nozzle and a filtrate outlet nozzle, whereby an operation to remove suspended solids the turbid liquid is preferably passed from top to bottom through the bed after which, and before repeating the cycle, clean liquid such as filtrate is passed through the bed from bottom to top to remove the solids trapped in the bed which leave the container as a suspension through a top outlet nozzle or connection, thereby characterized, that the container (1) with an upper a turbid liquid feed conduit (12) and a lower filtrate outlet conduit (16) is divided in the vicinity of the pervious horizontal base (2) in such a way that a dependent rim portion(s) (3) of the upper turbid liquid chamber (5) is movable to facilitate the discharge of the bed from the container.]

2. CANCELLED

[Liquid filtering apparatus according to Claim 1, thereby characterized, that means are provided to discharge the bed to a bed regeneration device (8), where the bed material is cleaned or cleaned and reactivated and recycled to the turbid liquid chamber (5) of the filtering apparatus (1) for reuse.]

3. "once amended"

[Liquid filtering apparatus according to Claim 1, thereby characterized, that means are provided to discharge the bed to a bed regeneration device (6), where the material of the bed is cleaned or cleaned and reactivated and thence recycled to a dosing device (7/20) and thence to the turbid liquid chamber (5) of the filtering apparatus (1) for reuse.]

In a travelling web, flat bed filter apparatus that functions intermittently and in the stationary, sealed position receives contaminated liquid in a horizontal upper chamber and delivers filtered liquid from a lower filtrate chamber having a section of filter web or medium lying on and supported by a horizontal, fixed, pervious support plate or fixed drainage plate; cover means with dependent rim sections extending downwards, the lower surfaces of which make direct sealing engagement with peripheral portions of said section of filter medium or web, thus forming an upper contaminant chamber; a receptacle for filtered liquid located beneath

the support plate having upstanding rim portions or a drainage plate with extended rim portions, whereby the upper surfaces of said rim portions make sealing engagement with the lower peripheral portions of the section of the filter medium or web, thus forming a lower filtrate chamber or drainage space; means for engaging and disengaging the said sealing surfaces of the upper cover and lower receptacle or recess, thus sealing and releasing respectively the said portions of the filter web; either a pressure pump located in a conduit in fluid connection with the means of contaminant supply and the interior of the upper contaminant chamber, combined with a liquid pressure pump the inlet of which is in liquid communication with the interior of the said receptacle for filtered liquid; or a suction/vacuum pump located directly in a conduit in fluid connection with the interior of the lower filtrate chamber or drainage space or indirectly through a filtrate receiver with a conduit in fluid communication with the interior of the lower filtrate chamber or drainage space; each of said pump configurations providing the means for transporting both contaminated and filtered liquid thereby creating and maintaining a pressure difference between the contaminant and filtrate chambers or drainage space; conduit means in fluid communication with a source of compressed gas and/or the surrounding atmosphere and the interior of the upper contaminant chamber; means for controlling the filtration operation consisting of liquid level and pressure switches connected to the filter chambers set to switch at maximum and/or minimum values, whereby said liquid level switches control the means for interrupting and initiating fluid flow in the gas conduits and the pressure switches are employed for interrupting or initiating the flow in the said liquid and gas conduits; transport means in engagement with the filter web to transport it over the said support plate consisting of a belt conveyor connected on both sides with chain and drive sprockets, whereby the improvement comprises means for the surface of the belt itself to act as both the filter web and conveyor of a granular filter bed that after use as filter medium is conveyed to means (6, 21) for the cleaning, regeneration and return of the grains of the bed directly to the said upper contaminant chamber or to an intermediate storage vessel for a subsequent filtration or purification cycle

4. "once amended"

[Liquid filtering apparatus according to Claim 1, thereby characterized, that means are provided to discharge the bed to a bed regeneration device (6), where the material of the bed is cleaned or cleaned and reactivated and thence recycled to the dosing device (7/20) and thence dosed to the turbid liquid chamber (5) of the filtering apparatus (1) during the filtration operation, whereby the depth of the bed increases incrementally during the operation.]

A liquid purification system according to Claim 1, whereby means are provided for dosing the cleaned and regenerated grains to the said contaminant chamber or to the feed of liquid to be purified during the purification operation.

5. CANCELLED

[Liquid purifying apparatus and method according to Claims 1-4, thereby characterized, that the cleaned and reactivated bed before being recycled to the turbid liquid chamber (5) for reuse is mixed with active powdered material such as bleaching earth, ion-exchange resins, activated carbon, etc.]

6. "once amended"

[Liquid purifying apparatus and method according to Claim 5, thereby characterized, that a dosing apparatus (8/19) is employed to dose the active powdered material to the granular material of the bed either before or during the purification operation when the depth of the bed increases incrementally.]

A liquid purification apparatus according to Claim 1, whereby means are provided to dose pre-mixed or separately dose cleaned and regenerated grains of the bed with the powdered adsorbent materials to the said contaminant filter chamber or the feed of liquid to be purified during the purification process.

7. CANCELLED**8. CANCELLED****9. "once amended"**

Liquid filtering apparatus according to [Claim 1, thereby characterized, that] any one of Claims 1-6, whereby means are provided in the form of a conically perforated distributor (27) that extends over the entire internal cross-section of the turbid liquid chamber (5).

10. CANCELLED**11. CANCELLED****12. "once amended"**

In a travelling web, flat bed filter apparatus that functions intermittently and in the stationary, sealed position receives contaminated liquid in a horizontal upper chamber and delivers filtered liquid from a lower filtrate chamber having a section of filter web or medium lying on and supported by a horizontal, fixed, pervious support plate or fixed drainage plate; cover means with dependent rim sections extending downwards, the lower surfaces of which make direct sealing engagement with peripheral portions of said section of filter medium or web, thus forming an upper contaminant chamber; a receptacle for filtered liquid located beneath the support plate having upstanding rim portions or a drainage plate with extended rim portions, whereby the upper surfaces of said rim portions make sealing engagement with the lower peripheral portions of the section of the filter medium or web, thus forming a lower filtrate chamber or drainage space; means for engaging and disengaging the said sealing surfaces of the upper cover and lower receptacle or recess, thus sealing and releasing respectively the said portions of the filter web; either a pressure pump located in a conduit in fluid connection with the means of contaminant supply and the interior of the upper contaminant chamber, combined with a liquid pressure pump the inlet of which is in liquid communication with the interior of the said receptacle for filtered liquid; or a suction/vacuum pump located directly in a conduit in fluid connection with the interior of the lower filtrate chamber or drainage space or indirectly

through a filtrate receiver with a conduit in fluid communication with the interior of the lower filtrate chamber or drainage space; each of said pump configurations providing the means for transporting both contaminated and filtered liquid thereby creating and maintaining a pressure difference between the contaminant and filtrate chambers or drainage space; conduit means in fluid communication with a source of compressed gas and/or the surrounding atmosphere and the interior of the upper contaminant chamber; means for controlling the filtration operation consisting of liquid level and pressure switches connected to the filter chambers set to switch at maximum and/or minimum values, whereby said liquid level switches control the means for interrupting and initiating fluid flow in the gas conduits and the pressure switches are employed for interrupting or initiating the flow in the said liquid and gas conduits; transport means in engagement with the filter web to transport it over the said support plate consisting of a belt conveyor connected on both sides with chain and drive sprockets, [Liquid filtering apparatus according to Claim 10,] whereby sections of the band are used as support for discrete strips of prefabricated filter media from storage means pre-cut to appropriate length and then introduced to the interior of the turbid liquid chamber (5) to coincide with the pervious horizontal base (2) and sealed at the periphery [(402)] by the dependent rim portion(s) (3) of the said chamber.

13. CANCELLED

14. "once amended"

Liquid purifying apparatus according to any one of Claims 4-6, [thereby characterized, that] whereby the dosing devices are controlled by a microprocessor (15) from input signals from feed and filtrate instrumentation (13,14).

15. "once amended"

In a travelling web, flat bed filter apparatus that functions intermittently and in the stationary, sealed position receives contaminated liquid in a horizontal upper chamber and delivers filtered liquid from a lower filtrate chamber having a section of filter web or medium lying on and supported by a horizontal, fixed, pervious support plate or fixed drainage plate; cover means with dependent rim sections extending downwards, the lower surfaces of which make direct sealing engagement with peripheral portions of said section of filter medium or web, thus forming an upper contaminant chamber; a receptacle for filtered liquid located beneath the support plate having upstanding rim portions or a drainage plate with extended rim portions, whereby the upper surfaces of said rim portions make sealing engagement with the lower peripheral portions of the section of the filter medium or web, thus forming a lower filtrate chamber or drainage space; means for engaging and disengaging the said sealing surfaces of the upper cover and lower receptacle or recess, thus sealing and releasing respectively the said portions of the filter web; either a pressure pump located in a conduit in fluid connection with the means of contaminant supply and the interior of the upper contaminant chamber, combined with a liquid pressure pump the inlet of which is in liquid communication with the interior of the said receptacle for filtered liquid; or a suction/vacuum

pump located directly in a conduit in fluid connection with the interior of the lower filtrate chamber or drainage space or indirectly through a filtrate receiver with a conduit in fluid communication with the interior of the lower filtrate chamber or drainage space; each of said pump configurations providing the means for transporting both contaminated and filtered liquid thereby creating and maintaining a pressure difference between the contaminant and filtrate chambers or drainage space; conduit means in fluid communication with a source of compressed gas and/or the surrounding atmosphere and the interior of the upper contaminant chamber; means for controlling the filtration operation consisting of liquid level and pressure switches connected to the filter chambers set to switch at maximum and/or minimum values, whereby said liquid level switches control the means for interrupting and initiating fluid flow in the gas conduits and the pressure switches are employed for interrupting or initiating the flow in the said liquid and gas conduits; transport means in engagement with the filter web to transport it over the said support plate consisting of a belt conveyor connected on both sides with chain and drive sprockets, [Apparatus and method of filtration control according to the defining preamble of claim 10, whereby means to control the filtration operation consist of a gas flow controller, a gas throttling valve and a gas pressure controller connected in series from a source of compressed gas to the turbid liquid chamber (5), thereby characterized, that the said means are employed to measure the permeability of any filter media before or during any liquid filtration or purification operation by introducing and filtering a volume of liquid of known quality to the turbid liquid chamber.] whereby the improvement comprises means for determining and/or controlling the rate of filtration of a quantity of liquid contained in the contaminant chamber comprising a gas flow meter (406), gas throttling valve (407) and gas pressure meter (405) in the said conduit in fluid communication with a source of compressed gas and the interior of the upper contaminant chamber.

16. “once amended”

Method of liquid purification control according to Claim 12 or 15, [thereby characterized, that whereby the quality of the turbid liquid and filtrate is determined by instrumentation such as (13, 14), whereby optionally the data are fed to a microprocessor / process controller (15) to choose and implement the supply of the optional filter medium before or during any liquid purification operation.] whereby in conjunction with the determination of the quality of the turbid liquid and filtrate by the means (13, 14), single sheets of known filtration characteristics are employed for determining the filtration characteristics of turbid liquids of unknown filtration characteristics, whereby the sheets after these determinations are transported out of the filter chamber for deposition or whereby sections of the filter band of unknown filtration characteristics are transported onto the said pervious support plate or fixed drainage plate for determining the filtration characteristics with liquids of known filtration characteristics.

17. “once amended”

Method of liquid purification control according to [Claims 11-16, thereby characterized, that] Claim 16, whereby the optimal mode of purification such as direct filtration by textiles, membranes, non-woven material, precoat filtration, deep bed purification with or without active powdered material [, etc.] is determined before or during any liquid purification operation.

18. CANCELLED

19. CANCELLED

20. CANCELLED

Office Action Summary

Application No.
09/242,072

Applicant(s)
Miller

Examiner
Ivare Cirtins

Art Unit
1724



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Nov 20, 2001
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 12, and 14-17 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 12, 15, and 16 is/are rejected.
- 7) ☒ Claim(s) 8, 9, 14, and 17 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☒ The proposed drawing correction filed on Apr 9, 2001 is: a) ☒ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

RECEIVED

MAY 10 2005

OFFICE OF PETITIONS

Art. Unit: 1724

The amendment filed November 20, 2001 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

(1) that "relatively small concentrations of specific organic and inorganic contaminants in solution and in a colloidal state" are removed by adsorbents (page 1, lines 36-37, of the specification);

(2) that prior art sand filters "inherently lacks the flexibility and versatility to handle todays demanding liquid purification requirements in the liquid processing industries" (page 1, lines 39-41, of the specification);

(3) that the aim of the invention is for "total media regeneration" (page 2, line 22, of the specification);

(4) that filtrate is recycled by a pressure pump (page 3, line 8, of the specification);

(5) that "diffusion enhancing processes" are employed (page 3, line 21, of the specification);

(6) that the controllers "provide the data input to the microprocessor for computing the filtration characteristics of the suspension determining instantaneous volumetric flow of gas

Art Unit: 1724

in the top container" (page 4, last three lines, of the specification) and;

(7) that a timer shuts valve 407 during the drying operation (page 5, line 39, of the specification).

Applicant is required to cancel the new matter in the reply to this Office action.

The proposed drawing corrections filed on April 9, 2001 have been approved.

Claims 8, 9, 14 and 17 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim must refer to other claims in the alternative only (claim 17), and may not serve as a basis for any other multiple dependent claim (claims 8, 9 and 14). Accordingly, these claims have not been further treated on the merits.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-7 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one

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skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. The limitation that a "pressure pump" is located in the system (claim 1, 5 and 7, line 18) does not appear to be supported by the disclosure originally filed, and hence constitutes new matter, since this original disclosure only taught suction/vacuum pump 28 in the system.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-7, 12, 15 and 16 are rejected as failing to define the invention in the manner required by 35 U.S.C. 112, second paragraph. The claims contain numerous vague and indefinite expressions. For example, the term "the stationary, sealed position" (claims 1, 5 and 7, line 2) lacks antecedent basis in the claims, and is therefore indefinite. Also, the term "whereby means are provided" (claims 2-4, lines 1-2) is vague, and indefinite as to the limitation intended. The term "the pervious horizontal base" (claim 5, line 44) lacks antecedent basis in the claim, and is therefore indefinite. Claims 12, 15 and 16 depend from a canceled claim (i.e. claim 10), and are therefore.

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indefinite. Furthermore, the terms "are used as" (claim 12, lines 1-2), "appropriate" (claim 12, line 3), "Apparatus and method" (claims 15 and 16, line 1), "according to the defining preamble" (claim 15, line 1), "are employed" (claim 15, line 5), "known quality" (claim 15, line 7), "such as" (claim 16, line 3), and "choose and implement the supply of the optimal filter medium" (claim 16, lines 4-5) are vague, and indefinite as to the limitations intended. Claim 6 depends from an indefinite claim (i.e. 2 or 3), and is therefore itself indefinite.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Serial Number: 09/242,072

Page 6

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to I. Cintins whose telephone number is (703) 308-3840. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM.

The fax phone numbers for this art unit are: (703) 872-9311 for "Official" faxes after Final Rejection; (703) 872-9310 for all other "Official" faxes; and (703) 872-9492 for "Draft" and other "Unofficial" faxes.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.

I. Cintins
March 10, 2002

Ivars Cintins
Ivars C. Cintins
Primary Examiner
Art Unit 1724

Response to Office Action / Cintins / 10 March 02 uspatcomplaintapp5B2

"The amendment filed Nov. 20 01 is objected to under 35USC132 because it introduces new matter into the disclosure.

- Objection (1) now deleted from the text.
- Objection (2) now deleted.
- Objection (3) now deleted.
- Objection (4) does not concern new material. The original description of pump 28 as a suction/vacuum pump is an error. From the description of its function and the flow sheet Fig. 5 it is obvious that the described function can only be carried out by a pump producing a positive (above atmospheric pressure) outlet pressure. The term suction/pressure pump is normally used for pumps of this nature and applies in the case at hand.
- Objection (5) now deleted.
- Objection (6) now deleted ("determining" can be seen to be synonymous with "measuring").
- Objection (7) now deleted.

PS: see pages 4 & 5 of the petition.

"Claims 8, 9, 14 and 17 are objected to under 37CFR1.75© as being in improper form because a multiple dependent claim must refer to other claims in the alternative only (claim 17), and may not serve as a basis for any other multiple dependent claim (claims 8,9 and 14). **Accordingly, these claims have not been further treated on the merits."**

In fact with the exception of Claim 17 these claims should have been further treated on the merits.

Reason:

In the response 2.April.01 to office action 3 March 01

- Dependent claim 8 was cancelled anyway.
- Dependent claim 9 refers in the alternative to any one of claims 1-6. Multiple dependent claim 5, independent claim 1 and single dependent claim 2 were effectively cancelled with bracketing leaving independent claim 3 and single dependent claims 4 and 6 as sole effective references.
- Dependent claim 14 refers in the alternative to any one of claims 4-6, effectively referring to single dependent claims 4 and 6 as sole effective references.
- In the present response claim 17 is cancelled.

Claims 1-7 are rejected under 35USC112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. The limitation that a "pressure pump" is located in the system (claim 1,5 and 7, line 18) does not appear to be supported by the disclosure originally filed, and hence constitutes new matter, since this original disclosure only taught suction/vacuum pump 28 in the system.

In the original IPC disclosure pages 2/3 under the heading THE INVENTION:

"Filter aid suspended in liquid in tank 11 is dosed into the vented container 5. While the pressure difference between the container 5 and the lower filtrate chamber 2 is raised, liquid to be purified in reservoir 10,.....is pumped using means 22 from reservoir 10 into container 5. Simultaneously, suspensionsare dosed using means 7/20 & 8/19 under pressure"

In the original IPC disclosure means 22 is obviously a "pressure pump located in a conduit (here 12) in fluid connection with the means of contaminant supply (here 10) and the

interior of the upper contaminant chamber delivering liquid to be purified to the container (here 5)”.
 Page 3, 18-12:

“Filtrate is recycled, if necessary by means of a suction/vacuum pump (28) through conduits 16 & 117 to reservoir 10.....Filtrate flow is switched to conduit 18 whence it is collected in a reservoir not shown. On reaching a pre-set **pressure differential** across the bed”
 Although some suction/vacuum pumps can transport liquid issuing from the outlet the designation here of suction/vacuum pump is obviously an error and should read suction/pressure pump. The functioning of this pump is not of vital importance to the process..
 The **pressure differential across the bed** is the function carried out by means 22 (a pressure pump).

PS: see page 5 of the petition.

„Claims 1-7, 12, 15 and 16 are rejected as failing to define the invention in the manner required by 35 USC 112, second paragraph.

The claims contain numerous vague and indefinite expressions.

For example

- The term “that functions intermittently and in the stationary, sealed position (Claims 1, 5 and 7, line 2) lacks antecedent basis in the claims, and is therefore indefinite.
False from original application, p.2, under THE INVENTION: “Fig.1 is a schematic flow-sheet of the apparatus of the invention that consists of a purifying filter plant 1,.....a lower **stationary filtrate chamber**.....on which a section of an **intermittently movable** filter belt..... which in operation is **stationary** and **sealed at the periphery** by vertically movable dependent rim portions 3 of an upper contaminant container 5 “
 All the essential characteristics quoted are supported in the original IPC disclosure.
- The term “whereby means are provided” (claims 2-4, lines 1-2) is vague and indefinite as to the limitation intended.
Wrong Claim 2 is cancelled and in Claim 3 the term is not present. .
 Claim 4 “once amended” and Claim 6 “once amended” appear to have been meant and the limitations 7/20 and 8/19 are now introduced in these claims as “second amendments”.
 The term “the pervious horizontal base (2)” (claim 5, line 44) lacks antecedent basis in the claim and is therefore indefinite.
False claim 5 is cancelled.
 Apparently claim 12 “once amended” is meant.
 (see original IPC disclosure above –first bullet THE INVENTION “Fig 1 is alower stationary filtrate chamber 2 with a porous upper surface on which a section of an intermittently movable filter belt.....sealed at the periphery”).
 To avoid further discussion the phrase “to coincidehorizontal base” is now cancelled.
- Claims 12, 15 and 16 depend from a cancelled claim (i.e. claim 10) and are therefore indefinite.
False in “once amended” Claims 12 and 15 the dependency on Claim 10 was deleted and for claim 16 a dependency on Claim 10 never existed.

Furthermore the terms

- “are used as” (claim 12, lines 1-2)
 semantics only (serve as, act as, are designed to, meant to, etc, can all be used) appropriate” (claim 12, line 3)

semantics only (right, correct, exact, precise, required etc. are all appropriate).

- “apparatus and method”(claims 15 and 16, line 1)
False 15 is a separate apparatus claim and 16 is a separate method claim.
- “according to the defining preamble” claim 15, line 1)...
False (already deleted in the “once amended” claim 15).
- “are employed” (claim 15, line 5)
False (already deleted in “once amended” claim 15)
- “known quality” (claim 15, line 7)
False (already deleted in “once amended” claim 15)
- “such as” (claim 16, line 3)
False (already deleted in “once amended” claim 16)
- choose and implement the supply of the optimal filter medium” (claim 16, lines 4-5) are vague, and indefinite as to the limitations intended.
False (already deleted in “once amended” claim 16).
- Claim 6 depends from an indefinite claim (i.e. 2 or 3) and is therefore itself indefinite.
Wrong (meant is claim 14 “once amended” dependent on Claim 4 and 6 each now “twice amended” and no longer indefinite.

Enclosed are

- 1) Copy of the complete amended claims at May, 02
- 2) Copy of the “clean” version at May, 02 of claims after “second amendments” for the purpose of clarity only.
- 3) Copy of the complete amended description at May, 02
- 4) Copy of the “clean” version at May, 02

043

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Advisory Action

Application No.
09/242,072

Applicant(s)
Miller

Examiner
Ivars Cintins

Art Unit
1724



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED Jun 7, 2002 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid the abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

THE PERIOD FOR REPLY (check only a) or b)

- a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
- b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection. **ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION.** See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.
2. ☒ The proposed amendment(s) will not be entered because:
- (a) ☒ they raise new issues that would require further consideration and/or search (see NOTE below);
- (b) ☒ they raise the issue of new matter (see NOTE below);
- (c) ☒ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
- (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: See the attached supplement.

3. ☐ Applicant's reply has overcome the following rejection(s): _____

4. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

5. ☐ The a) ☐ affidavit, b) ☐ exhibit, or c) ☐ request for reconsideration has been considered but does NOT place the application in condition for allowance because: _____

6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.

7. ☒ For purposes of Appeal, the proposed amendment(s) a) ☒ will not be entered or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: None

Claim(s) objected to: 8, 9, 14, and 17

Claim(s) rejected: 1-7, 12, 15, and 16

Claim(s) withdrawn from consideration: _____

8. ☐ The proposed drawing correction filed on _____ is a) ☐ approved or b) ☐ disapproved by the Examiner.

9. ☐ Note the attached Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____

10. ☐ Other: _____

IVARS CINTINS
PRIMARY EXAMINER
ART UNIT 1724

Art Unit: 1724

SUPPLEMENT TO ADVISORY ACTION

The proposed amendment filed June 7, 2002 has not been entered for at least the following reasons:

In the Specification

(1) Applicant's attempt to add to the disclosure that pressure cylinders 215 provide container sealing in addition to closure (see page 4, line 2 of the "marked-up" copy) does not appear to be supported by the original disclosure, and therefore raises the question of new matter.

(2) Applicant's attempt to change the disclosure that "A sample of filtrate flows through a turbidity meter 410" to "Simultaneously, filtrate flows through a turbidity meter 410" (page 5, line 18 of the "marked-up" copy) does not appear to be supported by the original disclosure, and therefore raises the question of new matter.

(3) Applicant's attempt to change the disclosure that "Cake drying" occurs in step 18 to "Gas continues to flow through the filter cake" (page 6, line 1 of the "marked-up" copy) does not appear to be supported by the original disclosure, and therefore raises the question of new matter.

In the Claims

(1) Applicant's attempt to present currently pending claim 1, in its entirety, as amended claim 3 is improper and confusing.

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If Applicant desires to merely eliminate the limitations of claim 3, then claim 3 should be canceled, and claim 1 left unchanged.

(2) Similarly, Applicant's attempt to present currently pending claim 2 as amended claim 4 is improper and confusing. Furthermore, the bracketed portions of "twice amended" claim 4 do not appear in currently pending claim 4. Currently pending claim 4 recites "Liquid filtering apparatus according to Claim 2 or 3, whereby means are provided in the form of a conically perforated distributor 27 that extends over the entire internal cross-section of the turbid liquid chamber 5." See the amendment filed November 20, 2001. Moreover, as in claim 4, the proposed deletions from claims 6, 9, 14 and 16 do not appear in the currently pending version of these claims (see the amendment filed November 20, 2001 for claims 6 and 9; and original claims 14 and 16). Applicant should note that the proposed amendment filed April 9, 2001 was not entered because it was considered "non-compliant" as explained in the Office letter dated October 2, 2001.

(3) As in "(1)" above, merely rewriting currently pending claims 5 and 7 as 12 and 15, respectively, is improper and confusing.

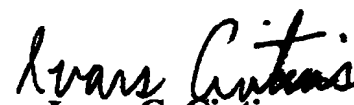
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Applicant is advised that any future amendments to the specification should only present paragraph(s)/section(s) (marked-up and clean versions) which are being changed, not the entire specification.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to I. Cintins whose telephone number is (703) 308-3840. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM.

The fax phone numbers for this art unit are: (703) 872-9311 for "Official" faxes after Final Rejection; (703) 872-9310 for all other "Official" faxes; and (703) 872-9492 for "Draft" and other "Unofficial" faxes.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.


Ivars C. Cintins
Primary Examiner
Art Unit 1724

I. Cintins
June 23, 2002

App 6

Peter Miller
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71229 Leonberg
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Uspatentoffice3A
06.08.02
Commissioner of Patents and
Trademarks
Washington DC 20231

Appl.No: 09/242072
Filing date: 14.1.2000
IPC Appl. PCT/AU96/00442

Applicant's Response to Office Action (Cintins) dated June 23. 2002

Enclosed:

- Response p. 2-4
 - Corrected marked-up version of claims / O/A, June 23, 02
 - Clean version of claims / O/A, June 23, 02
- + DESCRIPTION

Objections in the specification:

1) "Attempts to add to disclosure that pressure cylinders 215 provide container sealing in addition to closure (see P.4, line 2 of marked up copy) not supported by original disclosure and therefore raises the question of new matter."

Applicant's response:

See P2 original disclosure line 30:

"Is supported which in operation is stationary and sealed at the periphery by vertically moveable dependent rim portions 3"

And P4, lines 16-20:

"Fig. 3 is a sectioned drawing showing an improved method for ensuring that the dependent rims 3 when they take the form of peripheral, integral sides of the container 5 are actuated in the horizontal orientation when raised and lowered and that the full thrust of the fluid driven pistons in cylinders 215 is exerted when sealing the chamber against the horizontal pervious base 2."

2) "Applicant's attempt to change the disclosure that "A sample of filtrate flows through a turbidity meter 410" to "Simultaneously, filtrate flows through a turbidity meter 410" (Page 5, line 18 of the "marked-up" copy) does not appear to be supported by the original disclosure, and therefore raises the question of new matter."

Applicant's response:

Adding the word "simultaneously" can't be considered as new matter. This is backed up by Fig. 4 of the original disclosure where clearly the filtrate forced from the chamber 5 by compressed gas must simultaneously pass through 410 which is located in the filtrate conduit itself.

3) "Applicant's attempt to change the disclosure that "Cake drying" occurs in step 18 to "Gas continues to flow through the filter cake" (page 6, line 1 of the "marked up" copy does not appear to be supported by the original disclosure, and therefore raises the question of new matter."

Applicant's response:

Page 3, lines 14-15 of original disclosure:

"and external gas is fed through conduit 23 to container 5 whereby the residual liquid in the chamber and bed is removed."

The term "drying" is commonly used in filtration circles for the partial removal of liquid in filter cakes by passing gas through them. The word "drying" is mainly used loosely and for those not versed in the jargon of the technology it is often thought to mean "the drying action on matter by means of the application of heat". To avoid misunderstanding it is preferable to describe exactly what is meant by "drying" in the present specification. No new matter is being added in doing so. On page 3, lines 14-15, by feeding gas into the chamber and through the cake, the only interpretation is that the residual liquid in the cake is removed by pressure differential and/or by entrainment. Another way of concisely putting this is that "gas continues to flow through the filter cake".

Naturally, if this gas were blown through the cake long enough under appropriate humidity conditions the cake would eventually be “dried”. But this is not what is meant in the present invention, where one of the main objectives is to put the filter back on stream with as little delay as possible.
I hope this clarifies the matter.

Objections in the Claims:

1) “Applicant’s attempt to present currently pending claim 1, in its entirety, as amended Claim 3 is improper and confusing. If the applicant desires to merely eliminate the limitations of Claims 3, then Claim 3 should be cancelled and Claim 1 left unchanged.”

Claim 3 is now cancelled and Claims 1 and 2 are left unchanged.

2) “Similarly, Applicant’s attempt to present currently pending claim 2 as amended claim 4 is improper and confusing”.

Pending Claim 2 (as of office action 3 March, 2001):

“Liquid filtering apparatus according to Claim 1, thereby characterised, that means are provided to discharge the bed to a bed regeneration device (6), where the bed material is cleaned or cleaned and reactivated and recycled to the turbid liquid chamber (5) of the filtering apparatus (1) for reuse.”

Amended Claim 4 (App.2, 2 April 2001)

“A liquid purification system according to Claim 3, “once amended”, whereby means are provided for dosing the cleaned and regenerated grains to the said contaminant chamber or to the feed of liquid to be purified during the purification operation.”

Applicant’s response:

The substance of this claim differs significantly from pending Claim 2 (as of office action 3 March, 2001).

The concept of dosing the material of the bed during the purification process has far reaching innovative consequences compared with the traditional method of pre-forming a static bed.

Claim 4 in this form has been retained as dependent on Claim 2.

2. (continued):

“Furthermore, the bracketed portions of “twice amended” Claim 4 do (should?) not appear in currently pending Claim 4”.

Applicant’s response:

Correct. The bracketed portion of pending Claim 4 (as of office action 10 March, 2002 concerning marked up version of claims) could have been deleted but to prevent confusion (the applicant’s) it was retained.

(See enclosed corrected marked-up and clean versions)

2. (continued):

“Currently pending Claim 4 recites “Liquid filtering apparatus according to Claim 2 or 3, whereby means are provided in the form of a conically perforated distributor 27 that extends over the entire internal cross-section of the turbid liquid chamber 5. See the amendment filed November 20, 2001.”

Applicant's response:

Referred to here appears to be the filed “CLEAN” version of amendments (as of office action 10 March 2002).

There does not appear to be an objection pertaining to this “CLEAN” version.

This appears as Claim 9 “once amended” in the current marked up version

2. (continued):

“Moreover, as in claim 4, the proposed deletions for claims 6,9,14,16 do (should ?) not appear in the current pending versions of these claims (see amendment filed November 20, 2001 for claims 6,9: and original claims 14,16).

Applicant's response:

This has now been put right (see enclosed corrected marked-up and clean versions).

(6 August 2002)

uspawaterclaimsamend3

CLAIMS

1. "twice amended"

Liquid filtering apparatus in the form of an open or closed vessel containing deep, static beds of coarse granular material such as sand acting as filter medium supported on a porous floor that divides the vessel into an upper turbid liquid chamber with an inlet nozzle or connection and an upper outlet or connection for the removal of bed back-washing liquid and a lower filtrate chamber with a back-washing liquid inlet nozzle and a filtrate outlet nozzle, whereby an operation to remove suspended solids the turbid liquid is preferably passed from top to bottom through the bed after which, and before repeating the cycle, clean liquid such as filtrate is passed through the bed from bottom to top to remove the solids trapped in the bed which leave the container as a suspension through a top outlet nozzle or connection, [thereby characterized that] whereby the container (1) with an upper turbid liquid feed conduit (12) and a lower filtrate outlet conduit (16) is divided in the vicinity of the pervious horizontal base (2) in such a way that a dependent rim portion(s) (3) of the upper turbid liquid chamber (5) is movable to facilitate the discharge of the bed from the container.

2. "twice amended"

Liquid filtering apparatus according to Claim 1, [thereby characterized, that] whereby means are provided to discharge the bed to a bed regeneration device (6), where the bed material is cleaned or cleaned and reactivated and recycled to the turbid liquid chamber (5) of the filtering apparatus (1) for reuse.

3 Cancelled

4. "twice amended"

A liquid purification system according to [Claim 1] Claim 2, whereby means are provided for dosing the cleaned and regenerated grains to the said [contaminant] turbid liquid chamber or to the feed of liquid to be purified during the purification operation.

5. Cancelled

6. "twice amended"

A liquid purification apparatus according to [Claim 1] Claim 4 "twice amended", whereby means are provided to dose pre-mixed or separately dose cleaned and regenerated grains of the bed with the powdered adsorbent materials to the said contaminant filter chamber or the feed of liquid to be purified during the purification process.

7. Cancelled

8. Cancelled

9. "once amended"

Liquid filtering apparatus according to [anyone of Claims 1-6] Claim 4 "twice amended" or Claim 6 "twice amended", whereby means are provided in the form of a conically perforated distributor (27) that extends over the entire internal cross-section of the turbid liquid chamber (5).

10. Cancelled

11. Cancelled

12. "once amended"

In a travelling web, flat bed filter apparatus that functions intermittently and in the stationary, sealed position receives contaminated liquid in a horizontal upper chamber and delivers filtered liquid from a lower filtrate chamber having a section of filter web or medium lying on and supported by a horizontal, fixed, pervious support plate or fixed drainage plate; cover means with dependent rim sections extending downwards, the lower surfaces of which make direct sealing engagement with peripheral portions of said section of filter medium or web, thus forming an upper contaminant chamber; a receptacle for filtered liquid located beneath the support plate having upstanding rim portions or a drainage plate with extended rim portions, whereby the upper surfaces of said rim portions make sealing engagement with the lower peripheral portions of the section of the filter medium or web, thus forming a lower filtrate chamber or drainage space; means for engaging and disengaging the said sealing surfaces of the upper cover and lower receptacle or recess, thus sealing and releasing respectively the said portions of the filter web; either a pressure pump located in a conduit in fluid connection with the means of contaminant supply and the interior of the upper contaminant chamber, combined with a liquid pressure pump the inlet of which is in liquid communication with the interior of the said receptacle for filtered liquid; or a suction/vacuum pump located directly in a conduit in fluid connection with the interior of the lower filtrate chamber or drainage space or indirectly through a filtrate receiver with a conduit in fluid communication with the interior of the lower filtrate chamber or drainage space; each of said pump configurations providing the means for transporting both contaminated and filtered liquid thereby creating and maintaining a pressure difference between the contaminant and filtrate chambers or drainage space; conduit means in fluid communication with a source of compressed gas and/or the surrounding atmosphere and the interior of the upper contaminant chamber; means for controlling the filtration operation consisting of liquid level and pressure switches connected to the filter chambers set to switch at maximum and/or minimum values, whereby said liquid level switches control the means for interrupting and initiating fluid flow in the gas conduits and the pressure switches are employed for interrupting or initiating the flow in the said liquid and gas conduits; transport means in engagement with the filter web to transport it over the said support plate consisting of a belt conveyor connected on both sides with chain and drive sprockets, whereby sections of the band are used as support for discrete strips of prefabricated filter media from storage means pre-cut to appropriate length and then introduced to the interior of the turbid liquid chamber (5) to coincide with the pervious horizontal base (2) and sealed at the periphery by the dependent rim portion(s) (3) of the said chamber.

13. Cancelled

14. "twice amended"

Liquid purifying apparatus according to [any one of Claims 4-6] Claim 4 "twice amended" or Claim 6 "twice amended", whereby the dosing devices are controlled by a microprocessor (15) from input signals from feed and filtrate instrumentation (13,14).

15. "once amended"

In a travelling web, flat bed filter apparatus that functions intermittently and in the stationary, sealed position receives contaminated liquid in a horizontal upper chamber and delivers filtered liquid from a lower filtrate chamber having a section of filter web or medium lying on and supported by a horizontal, fixed, pervious support plate or fixed drainage plate; cover means with dependent rim sections extending downwards, the lower surfaces of which make direct sealing engagement with peripheral portions of said section of filter medium or web, thus forming an upper contaminant chamber; a receptacle for filtered liquid located beneath the support plate having upstanding rim portions or a drainage plate with extended rim portions, whereby the upper surfaces of said rim portions make sealing engagement with the lower peripheral portions of the section of the filter medium or web, thus forming a lower filtrate chamber or drainage space; means for engaging and disengaging the said sealing surfaces of the upper cover and lower receptacle or recess, thus sealing and releasing respectively the said portions of the filter web; either a pressure pump located in a conduit in fluid connection with the means of contaminant supply and the interior of the upper contaminant chamber, combined with a liquid pressure pump the inlet of which is in liquid communication with the interior of the said receptacle for filtered liquid; or a suction/vacuum pump located directly in a conduit in fluid connection with the interior of the lower filtrate chamber or drainage space or indirectly through a filtrate receiver with a conduit in fluid communication with the interior of the lower filtrate chamber or drainage space; each of said pump configurations providing the means for transporting both contaminated and filtered liquid thereby creating and maintaining a pressure difference between the contaminant and filtrate chambers or drainage space; conduit means in fluid communication with a source of compressed gas and/or the surrounding atmosphere and the interior of the upper contaminant chamber; means for controlling the filtration operation consisting of liquid level and pressure switches connected to the filter chambers set to switch at maximum and/or minimum values, whereby said liquid level switches control the means for interrupting and initiating fluid flow in the gas conduits and the pressure switches are employed for interrupting or initiating the flow in the said liquid and gas conduits; transport means in engagement with the filter web to transport it over the said support plate consisting of a belt conveyor connected on both sides with chain and drive sprockets, whereby the improvement comprises means for determining and/or controlling the rate of filtration of a quantity of liquid contained in the contaminant chamber comprising a gas flow meter (406), gas throttling valve (407) and gas pressure meter (405) in the said conduit in fluid communication with a source of compressed gas and the interior of the upper contaminant chamber.

16. "twice amended"

Method of liquid purification control according to [Claim 12 or 15] Claim 6 or 8, whereby in conjunction with the determination of the quality of the turbid liquid and filtrate by the means (13, 14), single sheets of known filtration characteristics are employed for determining the filtration characteristics of turbid liquids of unknown filtration characteristics, whereby the sheets after these determinations are transported out of the filter chamber for deposition or whereby sections of the filter band of unknown filtration characteristics are transported onto the said pervious support plate or fixed drainage plate for determining the filtration characteristics with liquids of known filtration characteristics.

17. Cancelled

18. Cancelled

19. Cancelled

20. Cancelled

CLEAN VERSION App. 6 (6 August 2002) identical with uspawaterstage3
App.4 CLEAN VERSION (20 October 2001) OF App.3 AMENDED
 VERSION (2 April 2001)

APPARATUS FOR LIQUID PURIFICATION

Description

This invention concerns apparatus for the purification of liquids. By purification is meant the removal of unwanted suspended, colloidal or dissolved substances from a liquid.

The prior art apparatus to achieve this consists of a large variety of generically related filters that utilize over-pressure and/or under-pressure to provide the necessary pressure difference for filtration.

For the purification of liquids, filter presses or pressure leaf, candle and cartridge filters (pressure vessels containing such elements) are utilized. Such liquids are chemicals, pharmaceutical products, beer, wine, sugar, oils and fats, petroleum products, etc. Their purification involves an "in-depth" filtration or purification process, whereby the liquid to be purified is either passed through or forms thereby a bed of particulate purification aid, whereby the separation mechanism is a combination of sieving-action and adsorption. The purification aids that are used include diatomaceous earth, bleaching earth, ion-exchange resin and activated carbon in powder form. The solid residues cannot be economically regenerated and their disposal poses an acute environmental problem.

On the other hand, using apparatus of the nutsche-type filter with open or closed containers, water is filtered by means of gravity or over-pressure on a large scale by means of thick, static beds of coarse granular material (e.g. sand). These beds are regenerated after filtration by back-washing techniques and reused. Although this method is suitable for the filtration of relatively clean surface and ground water, it is wholly unsatisfactory for the purification of industrial and domestic effluent. The reason is that the back-washing and regeneration techniques of prior art sand filters

- are inadequate for washing out the large variety of suspended solids contained in industrial liquid effluent.
- produce excessive amounts of contaminated back-wash liquid.

and

- the static nature of the beds is unsuited for the filtration of particulate matter as large sections of the bed remain unused thus precluding the possibility of utilizing the extensive range of available adsorbents comprising such materials as activated carbon, anthracite, ion-exchange resins, bleaching earth, molecular sieves, etc. required for removing specific contaminants in the field of effluent and water purification.

The goal of this invention is to further develop the art and science of "in-depth" filtration utilizing beds of loose material for the purification of liquids such as processed by the above named industries, whereby the beds for reuse are regenerated more effectively than with prior art methods, resulting in a considerable reduction in the quantity of liquid and solid waste generation.

Considering the present practice in both the industrial and communal sectors of discharging effluent to the natural environment that is incompletely purified, the further goal is to provide these sectors with an effluent and water purification

apparatus that will enable liquid effluent to be recycled and polluted water to be rendered suitable for domestic and industrial purposes.

It is further proposed that the apparatus of the invention will be far more compact and versatile compared with the prior art in that it can be installed not only in large industrial and communal plants, but also in medium to small size industrial sectors. This will be achieved by utilizing specific throughputs 10-100 times those normally employed by prior art filters. Specific throughputs of 50-200 m³/m².h will be possible because the beds will be maintained in the "open" condition throughout the filtration and/or purification cycles. Yet a further goal of the invention is to provide the liquid purification apparatus of the invention with the means for automatically selecting and applying varying types and grades of filter media and modes of operation according to the nature, filtration characteristics and requirements of any type of liquid purification operation, whereby no further distinction will be made between effluent, water and process liquid purification. The ultimate aim of the invention is to reduce the number of purification steps presently required for process liquid purification, whereby waste generation will be reduced and the purification media regenerated and reused, thus enhancing the competitiveness of these industries and simultaneously relieving the present negative impact on the environment: As for industries presently using liquids in their production processes for such operations as plating, dyeing, washing, coating, pickling, quenching, etc. the aim is to provide the means for regeneration to avoid altogether the necessity for waste dumping into the environment.

THE INVENTION

Fig. 1 is a schematic flow-sheet of the apparatus of the invention.

Fig. 2 is a schematic representation of a partly sectioned elevation of the media feeding mechanisms of the invention.

Fig. 3 is a sectioned drawing illustrating an improved apparatus for controlling the vertical movement of the container.

Fig. 4 shows apparatus for the control of the liquid purification process and filter operation.

Fig. 5 illustrates an innovative filtrate chamber design.

Fig. 6 shows schematically the concept of the reversible belt transport of the invention.

The schematic flow-sheet of the apparatus of the invention Fig.1 shows the purifying filter plant 1, comprising essentially a lower stationary filtrate chamber 2 with a porous upper surface on which a section of an intermittently movable filter belt 4 is supported which in operation is stationary and sealed at the periphery by vertically movable dependent rim portions 3 of an upper contaminant container 5 fitted with a conically perforated feed distributor 27 extending over the entire upper horizontal section, a bed regeneration apparatus 6, a bed material storage/dosing device 7/20, a filter aid suspension tank 11, one or more adsorbent storage/dosing devices 8/19, a reservoir for liquid to be purified 10 and a residue filter 9.

Filter aid suspended in liquid in tank 11 is dosed into the vented container 5. While the pressure difference between the container 5 and the lower filtrate chamber 2 is raised, liquid to be purified in reservoir 10, which may be dosed with flocculating substances such as polyelectrolytes, is pumped using means 22 from reservoir 10 into container 5. Simultaneously, suspensions of bed material recycled from regenerator 6 and activated powdered adsorbents are dosed using means 7/20 and 8/19 under pressure to a mixing section 29 of the delivery conduit 12 controlled by

microprocessor 15 from input data from instrumentation 13 and 14 in the delivery conduit 12 and the filtrate conduit 16 respectively. The liquid quality and process parameters (concentration) controlled include turbidity, pH, hardness, chlorinated organic substances, mineral oil, heavy metals, phosphates, nitrates, etc. as well as process variables such as pressure differential and throughput. Filtrate is recycled, if necessary, by means of a suction/pressure pump 28, through conduits 16, 17 to reservoir 10 until the concentration of contaminants in the filtrate is reduced to a set level as measured at 13. Filtrate flow is then switched to conduit 18 whence it is collected in a reservoir not shown. On reaching a pre-set pressure differential across the bed or a pre-set upper level of contaminant concentration as measured by instrumentation 13, pump 22 and all dosing apparatus are shut down and external gas is fed through conduit 23 to container 5 whereby the residual liquid in the chamber and bed is removed, after which the dependent rim portions 3 of the container 5 are raised and the bed is transported by the filter belt 4 and discharged into the bed regenerator 6. The dependent rim portions 3 are lowered onto a fresh section of belt and the cycle described above is repeated. The regenerator 6, in effect, removes adsorbate and entrapped particulate matter by means of ultra-sonic, turbulence and diffusion producing devices from the internal and external surfaces of the granular material, thereby regenerating, cleaning and restoring the desired activities to these surfaces. Clean liquid is introduced to 6 through conduit 24 and by means of hydraulic classification action the adsorbate and particulate matter are removed through conduit 25 to filter 9 to recover a solid waste. Depending on its nature, the recovered fluid is recycled to 10 or reprocessed. Not shown are the means for introducing and removing the bed regenerating and reactivating fluids to and from bed regenerator 6.

Fig. 2 is a schematic representation of a partly sectioned elevation of the media feeding mechanisms of the invention. Prior art filters have the disadvantage that a replacement of the filter medium involves lengthy shut-down periods and often excessive manual manipulation. A further goal, therefore, of the present invention is to provide the means for automatically and quickly fitting a large variety of prefabricated materials (e.g. membranes, paper, carton, etc.) to fulfil the requirements of the liquid processing industries. Pressure cylinders 215, normally hydraulic or pneumatic rams, are provided for actuating the dependent rim portions of the filter container 5 in the vertical direction for bed removal and container closure and sealing.

A plurality of rolls of filter media 209, 210 are provided for feeding sections onto the lower filtrate chamber 2. Drive rollers 220, 221 located on the surface of the media rolls and actuated by a brake/clutch mechanism 225 driven by the filter belt 217 through idle rollers 207 feed lengths of filter band over a guide 223 into the rollers 207 onto the surface of the moving filter belt 217. Belt sensor 218 shuts down the belt drive motor 216 and actuates the band slitting mechanism 208 after which the sections of filter medium and the supporting filter belt are finally positioned in the container 5 and the depending rim portions of the container are lowered to seal the periphery of said sections. After filtration the used section of filter medium is transported out of the container 1 for disposal.

Cassettes 212, located externally to the filter container 1, are designed to feed pre-cut, pre-fabricated sheets of various types of filter media such as membranes, paper, carton, etc. into the filter container for filtration. Individual sheets are taken from the top of spring-loaded bundles by means of actuated rubberized rollers 213 and fed on guides 224 to synchronously driven feeder belt or belts 214, whereby after

positioning on the porous upper surface of the filtrate chamber 2, the dependent rim portions 3 of the container 5 are lowered to seal both the belt and the overlying section of filter medium. After the filtration operation the section of filter medium is transported out of the container 1 for disposal.

Fig.3 is a sectioned drawing showing an improved method for ensuring that the dependent rims 3 as peripheral, integral sides of the container 5 are actuated in the horizontal orientation when raised and lowered and that the full thrust of the fluid driven pistons in the cylinders 215/304 is exerted when sealing the container 5 against the horizontal pervious base 2. The bodies of the cylinders 305 are fixed to an external load-bearing framework 306 with the external extremity of the lubricated shafts 307 connected to the lower ends of vertically sectioned cylindrical sleeves 301 extending to and fixed at the ends of transverse beams 308 which in turn actuate thrust shafts 303 acting directly through seals onto the top peripheral part of the container 5. Annular sections of guiding plastic material 302 are fixed to the surface of the cylinders fitting into spaces between the surface of the cylinders and the inner surface of the reciprocating sleeves 301.

Fig. 4 is a schematic representation of part of the apparatus of the invention for controlling the

- automatic selection of filter media;
- automatic selection of the optimal mode of filtration or purification;
- automatic measurement of the permeability of sections of filter media;
- automatic regeneration of partially "blinded" sections of filter media.

A typical procedure according to the invention for the filtration or purification of a quantity of liquid of unknown filtration characteristics is the following:

A liquid is to be clarified, whereby the filtrate in the filter residue (cake) is to be recovered by a washing operation. The required degree of clarification in units of turbidity is known. This and other pertinent data are entered into the programmed microprocessor 15 and the following sequence of operations proceeds fully automatically:

Start

Testing:

1. A section of 10 micron retention filter paper from 212 is automatically fed into the container.
2. The dependent rim portions of the container 5 are lowered to seal the section of paper lying on the filtrate chamber.
3. The differential pressure controller 404 establishes a pre-set pressure differential between the chamber sealing space 402 and the filtrate chamber 403.
4. With the container 1 vented, approx. 15 l/m² of the suspension are introduced to the top container 5 and distributed over the surface of the sealed section of filter paper.
5. Compressed gas is introduced to the top chamber through control valve 407, whereby the gas pressure and flow controllers 405/6 control the filtration operation and indirectly establish the filtration characteristics of the suspension by determining the volumetric flow of gas in the top container 5. Simultaneously, filtrate flows through a turbidity meter 410 to record the degree of clarity of the filtrate for input to the microprocessor.

.....

The computer chooses the filtration mode and type of medium:

Mode: pre-coat with medium speed diatomite with 1% body feed.

Medium: 20 micron polyester mono-filament section of belt.

-
6. The dependent rim portions 3 are raised and the filter paper is discharged.
 7. The 20 micron belt section is automatically positioned in the container 1.
 8. Steps 3,4,5 are repeated with a liquid of known filtration characteristics.
 9. (a) Result of permeability test: negative.

The section of belt is subjected to a standard cleaning/regeneration procedure after which steps 3,4,5 are repeated.

(b) Result: positive. With the container 1 vented, approx. 20 l/m² of diatomite suspension are introduced to the top container 5.

Filtration Operation:

10. While the chamber 5 is being pressurised with gas, suspension to be filtered with 1% diatomite body-feed is introduced under pressure through valve 401. The feed rate is controlled by a pressure differential controller 405. Filtration proceeds.
11. On reaching a pre-set pressure differential, filtration terminates. Valve 401 shuts.
12. Valve 407 opens. Gas forces rest suspension through the filter cake.
13. Gas flow controller 406 signals a break-through of gas through the filter cake.

Cake Washing:

14. Valve 407 shuts.
15. Valve 408 opens. A pre-set quantity of wash liquid is fed to the container 5.
16. Valve 408 shuts. Valve 407 opens. Gas forces wash liquid through the cake.
17. The flow controller 406 signals a break-through of gas through the filter cake.

Cake Drying:

18. Gas continues to flow through the filter cake.
19. Valve 407 shuts. Container is vented by opening 411. Container opens.

Cake Discharge:

20. Belt transport
21. Belt wash (belt wash liquid is used for subsequent cake wash operation).
22. 20 micron belt section relocated in the container 1.

-cycle repeated-

Fig. 5, 6 show a schematic representation of an innovative filtrate chamber 2, whereby the prior art fixed pervious bed is replaced by manually removable pervious elements 502 to facilitate the cleaning and/or sterilization of the internal surfaces and drainage members 504. According to the invention only planar, smooth surfaces of the floor of the filter chamber remain after the manual removal of the elements. In a preferred design, the filtrate chamber consists of hollowed-out plate 505 with smooth polished upper surfaces on which the removable elements, consisting of expanded sheets or layers of woven mesh of metal or plastics which are covered and are integral with flat perforated sheet, mesh or profiled grid material. To accommodate the high liquid through-puts of the invention and to minimize the bulk and cost of the elements, generously proportioned multiple filtrate outlet conduits 506 are provided, coinciding with the intervals of the fluid driven cylinders 215, whereby the conduits are made integral with the supporting framework and designed to support the filtrate chamber as well as to withstand the thrust of the closure of the upper container. These conduits are also designed for ease of access and cleaning.

Fig. 7 shows a schematic drawing, wherein the filter web consists of a belt that is driven by a motor or actuator 702 to reverse the direction of transport of the belt to enable the discharge of the filter bed or filter cake at either end of the purifying apparatus 1. One of the major advantages of this configuration is that the permanent attachment of a bed regenerator 6 and a filter cake receiver at either end can be accommodated.

The above described invention effectively bridges the gap between prior art sand (in-depth) and pressure filters presently employed in the liquid processing industries.

The implications are that both liquid processing and using industries can be rationalized and improved to increase their competitiveness and simultaneously reduce considerably the present negative impact on the environment.

OA 10



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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/242,072 | 01/14/2000 | Peter Anthony Miller | | 9520 |

7590 12/10/2002
Peter Anthony Miller
See Str 27
Leonberg, D 71229
GERMANY

EXAMINER

CINTINS, IVARS C

ART UNIT PAPER NUMBER

1724

DATE MAILED: 12/10/2002

31

Please find below and/or attached an Office communication concerning this application or proceeding.

Advisory ActionApplication No.
09/242,072

Applicant(s)

Miller

Examiner

Ivars Cintins

Art Unit

1724

— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —

THE REPLY FILED Aug 16, 2002 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid the abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

THE PERIOD FOR REPLY (check only a) or b))

- a) ☒ The period for reply expires 6 months from the mailing date of the final rejection.
- b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection. ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

- ☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.
2. ☒ The proposed amendment(s) will not be entered because:
- (a) ☒ they raise new issues that would require further consideration and/or search (see NOTE below);
- (b) ☐ they raise the issue of new matter (see NOTE below);
- (c) ☒ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
- (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: See attached supplement.

3. ☐ Applicant's reply has overcome the following rejection(s):

4. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

- ☐ The a) ☐ affidavit, b) ☐ exhibit, or c) ☐ request for reconsideration has been considered but does NOT place the application in condition for allowance because:

6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.

7. ☒ For purposes of Appeal, the proposed amendment(s) a) ☒ will not be entered or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: None

Claim(s) objected to: 8, 9, 14, and 17

Claim(s) rejected: 1-7, 12, 15, and 16

Claim(s) withdrawn from consideration: None

8. ☐ The proposed drawing correction filed on _____ is a) ☐ approved or b) ☐ disapproved by the Examiner.

9. ☐ Note the attached Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____

10. ☐ Other:

Ivars Cintins
IVARS CINTINS
PRIMARY EXAMINER
ART UNIT 1724

App Unit: 1724

SUPPLEMENT TO ADVISORY ACTION

The proposed amendment filed August 16, 2002 cannot be entered because the "marked-up" version of the claims does not correspond to the "clean" version of the claims, as required by 37 C.F.R. § 1.121(c). For example, the "marked-up" version of the claims indicates that claims 3, 5, 7 and 8 have been cancelled, but the "clean" version of the claims presents text for these claims. Also, the "marked-up" version of claim 6 begins "A liquid purification apparatus ..." while the "clean" version of this claim begins "In a travelling web." Accordingly, "marked-up" claim 6 clearly does not correspond to "clean" claim 6. Similarly, "marked-up" claims 4 and 9 do not appear to correspond to "clean" claims 4 and 9. Furthermore, Applicant has presented a "marked-up" version for claims 12 and 14-16, but has failed to provide a "clean" version of these claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to I. Cintins whose telephone number is (703) 308-3840. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. David Simmons, can be reached at (703) 308-1972.

Serial Number: 09/242,072

Page 3

Art Unit: 1724

The fax phone numbers for this art unit are: (703) 872-9311 for "Official" faxes after Final Rejection; (703) 872-9310 for all other "Official" faxes; and (703) 872-9492 for "Draft" and other "Unofficial" faxes.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Ivars Cintins
Ivars C. Cintins
Primary Examiner
Art Unit 1724

I. Cintins
December 5, 2002

App. 8

1

Peter Miller
2, Heighley Cottage
Espley
Morpeth
Great Britain
NE61 3BY

11.3.2003

Commissioner of Patents and
Trademarks
Washington DC 20231

Appl.No: 09/242072
Filing date: 14.1.2000
IPC Appl. PCT/AU96/00442
Examiner : Cintins

Applicant's Response to Office Action dated 5 December 2002

Examiner's main point:

"The proposed amendment filed August 16, 2002 cannot be entered because the "marked-up" version of the claims does not correspond to the "clean" version of the claims, as required by 37 CFR §1.121©"

Applicant's response:

In the applicant's 37 CFR version (revised as of July 1, 1998) under §1.121© is

"Amendments in reexamination proceedings"

Any proposed amendment to the description and claims in patents involved in reexamination proceedings must be made in accordance with §1.530(d)."

This is obviously not appropriate for the present case.

However perhaps the examiner had **§1.121(a)** in mind, namely:

"Amendments in nonprovisional applications"

In this paragraph and all other paragraphs of §1.121 dealing exclusively with the manner of making amendments there is no reference to regulations concerning “CLEAN” versions of specifications.

However referring to *Office Action*, 2 (OA6) October 2001 (see Annex A) reference is made to 37CFR 1.121 as amended on September 8, 2000 in the following objections:

“1. The amendment does not include a clean version of the replacement section(s) 37 CFR 1.121(b)(1)(ii)”
and

“3. The amendment does not include a clean version of the amended claim(s) 37 CFR 1.121(c) (1) (i)”

The applicant responded by forwarding clean versions(App.4, 20 Oct. 2001), whereby the Claims were numbered 1-9 consecutively omitting all cancelled claims and their numbering in the marked-up version..

This was accepted by the Legal Instruments Examiner the author of the Notice of Non-Compliant Amendment (37 CFR 1.121).

The posting of this Notice apparently passed through the hands of the Examiner and would appear that the officer responsible for mailing this Notice failed to include the copy of an information flyer (MPEP Bookmark Bulletin on “Simplified Amendment Practice”) declared to be forwarded to the Applicant by the Legal Examiner presumably as a gesture of support (see bottom paragraph of Annex A).

A copy of this Bulletin as well as 37 CFR 1.114 (RCE) would be welcomed by the Applicant even at this late stage.

Conclusion

The Applicant is convinced that if the latest version of the Simplified Amendment Practice had been timely forwarded to him as declared, the subsequent objections concerning *trivial matters of form* in the Application would have been avoided.

Attachment: Annex A

P Miller, Applicant and Inventor

USpatentoffice 4ää

OA6

ANDEX A



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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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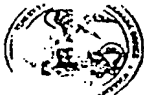
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| ART UNIT | PAPER NUMBER |
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DATE MAILED:

Notice of Non-Compliant Amendment (37 CFR 1.121)

The amendment filed on 4-9-01 is considered non-compliant because it has not been submitted in the format required under 37 CFR 1.121, as amended on September 8, 2000 (see 65 Fed. Reg. 54603, Sept. 8, 2000, and 1238 O.G. 77, Sept. 19, 2000).

- ☒ 1. The amendment does not include a clean version of the replacement paragraph(s)/section(s). 37 CFR 1.121(b)(1)(ii).
- ☐ 2. The amendment does not include a marked-up version of the replacement paragraph(s)/section(s). 37 CFR 1.121(b)(1)(iii).
- ☒ 3. The amendment does not include a clean version of the amended claim(s). 37 CFR 1.121(c)(1)(i).
- ☐ 4. The amendment does not include a marked-up version of the amended claim(s). 37 CFR 1.121(c)(1)(ii).
- ☐ 5. Other _____
- ☐ **PRELIMINARY AMENDMENT:** Unless applicant re-submits the preliminary amendment in compliance with revised 37 CFR 1.121 within ONE MONTH of the mail date of this letter, examination on the merits may commence without entry of the originally proposed preliminary amendment. This notice is not an action under 35 U.S.C. 132, and this ONE MONTH time limit is not extendable.
- ☒ **AMENDMENT AFTER NON-FINAL ACTION:** Since the above mentioned reply appears to be *bona fide*, applicant is given a TIME PERIOD of ONE (1) MONTH or THIRTY (30) DAYS from the mailing date of this notice, whichever is longer, within which to supply the omission or correction in order to avoid abandonment. EXTENSIONS OF THIS TIME PERIOD MAY BE GRANTED UNDER 37 CFR 1.136(a).

For your convenience, attached to this correspondence is a copy of an informational flyer (MPEP Bookmark Bulletin on "Simplified Amendment Practice").

Teresa Woodruff
Legal Instruments Examiner



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WAK
Paper Number 33

In re Application of
Peter Miller
Serial No.: 09/242, 072
Filed: January 14, 2000
For: APPARATUS FOR LIQUID PURIFICATION

DECISION ON
PETITION

This is a Decision on the Petition filed under 37 C.F.R. 1.181 on September 5, 2002. The Petition request that Applicant's "Response III", filed August 16, 2002 be treated as being filed timely and as basis for determining a declaration of allowance. Applicant further comments in his petition that the final rejection mailed March 13, 2002 cannot be justified.

The Examiner has considered Applicant's response filed August 16, 2002 and an advisory action was mailed December 12, 2002. The final rejection dated March 13, 2002 is not premature and is justified because the only new grounds of objection and rejection contained in the office action were necessitated by Applicant's amendment filed November 20, 2001. This amendment introduced new matter into both the specification and claims. Applicant's amendment necessitated the new grounds(s) of rejection presented in the office action.

The PETITION is dismissed.

The period for reply expires 6 months from the mailing date of the final rejection. The final rejection was mailed on March 13, 2002. The application is abandoned because the maximum extendable period for reply has expired.

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THM
Paper Number 35

In re Application of
Peter Miller
Serial No.: 09/242, 072
Filed: January 14, 2000
For: APPARATUS FOR LIQUID PURIFICATION

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:
: DECISION ON
: PETITION
:
:

This is a Decision on the Petition filed under 37 C.F.R. 1.181 on April 21, 2003. The Petition requests that the holding of abandonment of January 12, 2003 be withdrawn and Applicant's "Response App.6", filed August 16, 2002 be treated as being filed timely and as basis for determining a declaration of allowance. Applicant further comments in his petition that the final rejection mailed March 13, 2002 cannot be justified.

As noted in the Petition Decision mailed January 6, 2003, the Examiner has properly considered Applicant's response filed August 16, 2002 and an advisory action was mailed December 12, 2002. The Decision also held that the final rejection dated March 13, 2002 is not premature and is justified because the only new grounds of objection and rejection contained in the office action were necessitated by Applicant's amendment filed November 20, 2001. That amendment introduced new matter into both the specification and claims. Applicant's amendment necessitated the new ground(s) of rejection presented in the office action. As discussed in the MPEP at 706.07(a):

Under present practice, second or any subsequent actions on the merits shall be final, except where the examiner introduces a new ground of rejection that is neither necessitated by applicant's amendment of the claims nor based on information submitted in an information disclosure statement filed during the period set forth in 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p).

With respect to the consideration of Applicant's "Response App.6", it should be noted that MPEP 714.13 states:

It should be kept in mind that applicant cannot, as a matter of right, amend any finally rejected claims, add new claims after a final rejection (see 37 CFR 1.116) or reinstate previously canceled claims. Except where an amendment merely cancels claims, adopts examiner suggestions, removes issues for appeal, or in some other

way requires only a cursory review by the examiner, compliance with the requirement of a showing under 37 CFR 1.116(c) is expected in all amendments after final rejection. Failure to properly reply under 37 CFR 1.113 to the final rejection results in abandonment.

Regarding the issue of Abandonment, Applicant's petition has no merit. All the procedures of the Rules and Statutes were properly followed in the prosecution of the application and Applicant failed to take appropriate action to prevent abandonment. After-final practice is governed by 37 CFR 1.113 and states:

37 CFR 1.113: Final rejection or action.

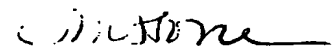
(a) *On the second or any subsequent examination or consideration by the examiner the rejection or other action may be made final, whereupon applicants, or for ex parte reexaminations filed under § 1.510, patent owner's reply is limited to appeal in the case of rejection of any claim (§ 1.191), or to amendment as specified in § 1.114 or § 1.116. Petition may be taken to the Commissioner in the case of objections or requirements not involved in the rejection of any claim (§ 1.181). Reply to a final rejection or action must comply with § 1.114 or paragraph (c) of this section. For final actions in an inter partes reexamination filed under § 1.913, see § 1.953.*

(b) *In making such final rejection, the examiner shall repeat or state all grounds of rejection then considered applicable to the claims in the application, clearly stating the reasons in support thereof.*

(c) *Reply to a final rejection or action must include cancellation of, or appeal from the rejection of, each rejected claim. If any claim stands allowed, the reply to a final rejection or action must comply with any requirements or objections as to form.*

The PETITION is **DISMISSED**.

No period for response exists in this application. If Applicant considers the abandonment of the application unintentional, a petition may be filed under 37 CFR 1.137(b).



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Annex 'B'

PA 08/503401 "Travelling sheet flat bed filter system and method"

Filing date: July 17, 1995

Claims

1.

In a travelling web, flat bed filter apparatus that functions intermittently and in the stationary, sealed position receives contaminated liquid in a horizontal upper chamber and delivers filtered liquid from a lower filtrate chamber

having

- a section of filter web or medium lying on and supported by a horizontal, fixed, pervious support plate or fixed drainage plate;
- cover means with dependent rim sections extending downwards, the lower surfaces of which make direct sealing engagement with peripheral portions of said section of filter medium or web, thus forming an upper contaminant chamber;
- a receptacle for filtered liquid located beneath the support plate having upstanding rim portions or a drainage plate with extended rim portions, whereby the upper surfaces of said rim portions make sealing engagement with the lower peripheral portions of the section of the filter medium or web, thus forming a lower filtrate chamber or drainage space;
- means for engaging and disengaging the said sealing surfaces of the upper cover and lower receptacle or recess, thus sealing and releasing respectively the said portions of the filter web;

either

- a pressure pump located in a conduit in fluid connection with the means of contaminant supply and the interior of the upper contaminant chamber, combined with a liquid pressure pump the inlet of which is in liquid communication with the interior of the said receptacle for filtered liquid;

or

- a suction/vacuum pump located directly in a conduit in fluid connection with the interior of the lower filtrate chamber or drainage space or indirectly through a filtrate receiver with a conduit in fluid communication with the interior of the lower filtrate chamber or drainage space;
- each of said pump configurations providing the means for transporting both contaminated and filtered liquid thereby creating and maintaining a pressure difference between the contaminant and filtrate chambers or drainage space;
- conduit means in fluid communication with a source of compressed gas and/or the surrounding atmosphere and the interior of the upper contaminant chamber;
- means for controlling the filtration operation consisting of liquid level and pressure switches connected to the filter chambers set to switch at maximum and/or minimum values, whereby said liquid level switches control the means for interrupting and initiating fluid flow in the gas conduits and the pressure switches are employed for interrupting or initiating the flow in the said liquid and gas conduits;
- transport means in engagement with the filter web to transport it over the said support plate whereby the web is discarded after use or consists of an endless band connected on both sides with chain and sprockets for tracking purposes,

whereby the improvement comprises means additional to and independent of the said direct sealing engagement of the rim portions of the filter chambers and filter medium comprising vertically movable barriers of a resilient material in or adjacent to the sealing surfaces of the said rim portion of the filter chambers which in the sealed position form a sealed/sealing space(s) **204** between or adjacent to the sealing surfaces.

2.

Apparatus according to Claim 1, whereby means consisting of a source of fluid under pressure **308** is connected by conduit means **304** to the sealing space(s) **204**.